

BOTANICAL ABSTRACTS

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IMPORTANT NOTICE

Beginning with the literature of 1926, the Union of American Biological Societies will inaugurate **BIOLOGICAL ABSTRACTS**, the first issue to appear about June, 1926. The journal will strive to present adequate abstracts and accurate indexes of the world's literature in theoretical and applied biology.

As announced, **BOTANICAL ABSTRACTS** will be merged in the new journal, as will **ABSTRACTS OF BACTERIOLOGY** and the abstracting sections of several other journals. In order, however, that there may be no serious gap between Botanical Abstracts and Biological Abstracts, the present additional volume (Volume 15) of Botanical Abstracts is being issued to cover the literature appearing to the close of 1925, as well as to bring up the more serious arrears and omissions during the period covered by Botanical Abstracts (1919-1925). This additional volume will be kept open long enough (year or more, with issues becoming less frequent) to permit at least moderately complete accumulation of the material in question; for a time, therefore, Biological Abstracts and Botanical Abstracts will be appearing side by side, though obviously without duplication of effort.

The **INDEXES** for Volumes 12, 13, and 14 (respectively Nos. 10, 12, and 12) of Botanical Abstracts are in preparation and when issued will be distributed to subscribers without further charge.

All correspondence regarding subscriptions, back sets, and the index for the first ten volumes of Botanical Abstracts should be addressed to the Business Manager of Botanical Abstracts, Natural Science Building, Ann Arbor, Michigan, U. S. A.

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BOTANICAL ABSTRACTS

A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense.

UNDER THE DIRECTION OF

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.

J. R. SCHRAMM, Editor-in-Chief

FREDERICK V. RAND, Associate Editor-in-Chief
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APRIL-MAY, 1926

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ENTRIES 3051-4431

AGRONOMY (CROPS AND SOILS)

A. J. PIETERS, *Editor*

MARY R. BURR, *Associate Editor (Crops)*

T. D. RICE, *Associate Editor (Soils)*

(See also in this issue Entries 3265, 3303, 3306, 3312, 3318, 3361, 3370, 3398, 3399, 3422, 3508, 3531, 3542, 3548, 3555, 3573, 3580, 3583, 3584, 3592, 3594, 3607, 3611, 3625, 3646, 3664, 3975, 4034, 4081, 4100, 4118, 4177, 4214, 4217, 4218, 4219, 4272)

CROP SCIENCE (ARVICULTURE)

3051. ANONYMOUS. A clover-like turf plant for the south. Bull. Green Sect. U. S. Golf Assoc. 5: 275. Fig. 1. 1925.—Three flowered beggarweed (*Desmodium triflorum* L.) is a native of India now abundantly introduced into Florida. It makes patches of excellent turf similar to white clover.—L. W. Kephart.

3052. ANONYMOUS. A new lawn-grass for St. Louis. Missouri Bot. Gard. Bull. 13: 113-120. Pl. 22-25. 1925.—The "Washington strain" of *Agrostis stolonifera* is recommended on the basis of careful trials. Full planting and cultural directions are given, including methods of combating the brown patch diseases.—O. T. Wilson.

3053. ANONYMOUS. A weed that makes good turf in the South. Bull. Green Sect. U. S. Golf Assoc. 5: 115. 1925.—Fern weed, wart cress or swine cress (*Senebiera coronopus*) is said to make an excellent winter turf.—L. W. Kephart.

3054. ANONYMOUS. Australian wheats. Jour. Dept. Agric. Victoria 22: 46. 1924.—An announcement of a new bulletin describing 82 varieties of wheat grown in Australia, prepared by the special committee on seed improvement and issued by the Institute of Science and Industry, Melbourne. Information is also given on amount of foliage, height and coarseness of straw, disease resistance, etc.—Wm. E. Lawrence.

3055. ANONYMOUS. Bird islands of Peru. [Rev. of: MURPHY, ROBERT CUSHMAN. Bird islands of Peru: The record of a sojourn on the West Coast. xx + 362 pp. + 32 pl. G. P. Putnam's Sons: New York and London, 1925.] Nature 116: 568-569. 1925.

3056. ANONYMOUS. Broom millet. Prohibition of importation from other countries. Agric. Gaz. New South Wales 36: 797-798. 1925.—General suggestions are made relative to

the broom millet crop for New South Wales consequent upon its non-importation because of fear of the European corn borer.—*L. R. Waldron.*

3057. ANONYMOUS. **Creeping bent and seaside bent.** Bull. Green Sect. U. S. Golf Assoc. 5: 74-75. 1925.—These 2 turf grasses are not the same, though very similar. The former is the grass that comes in South German mixed bent seed and to which belong, among others, the well-known strains called Washington, Metropolitan and Columbia. The latter occurs both in Europe and America along the sea coast. Strains of this grass from different regions differ markedly in resistance to brown patch disease and in other ways.—*L. W. Kephart.*

3058. ANONYMOUS. **Dichondra—a weed in southern putting greens.** Bull. Green Sect. U. S. Golf Assoc. 5: 129. 1925.—*Dichondra carolinensis* appears as a weed in putting greens from Norfolk, Va. to Florida and Texas. It makes turf of about the same quality as white clover and is sometimes used as a lawn plant in shady places. No means of eradication is known.—*L. W. Kephart.*

3059. ANONYMOUS. **Experimental farming work in the North [Queensland].** Australian Sugar Jour. 6: 350. 1925.—The extent and variety of work being carried on for the improvement of general agriculture was demonstrated by exhibits at the Brisbane Show. This work includes experiments with wilt-resistant varieties of tomatoes, honey sorgo introduced from America, Groit, Brabham, and Victor cowpeas also introduced from America, velvet beans, Biloxi soy beans and other crops.—*Nellie E. Fealy.*

3060. ANONYMOUS. **Mr. Henry Tryon, Government entomologist and plant pathologist.** Australian Sugar Jour. 17: 249. 1925.—The various fields of scientific research which have claimed Tryon's attention are enumerated, including his discovery and introduction into Queensland and New South Wales of 65 different kinds of sugar cane. In 1895 Tryon developed the idea of the Bureau of Sugar Experiment Stations. A list of his published works on sugar is given.—*Nellie E. Fealy.*

3061. ANONYMOUS. **New crossbred wheats. Tests at Carwarp.** Jour. Dept. Agric. Victoria 22: 302-303. 1924.—Twenty-four new crossbred wheats gave an increased yield of 15% when compared with 6 standard varieties grown in the same district. The best yielding hybrids contained a strain of Indian wheat.—*Wm. E. Lawrence.*

3062. ANONYMOUS. **Rubber—its friends and foes, rubber in south India.—Prevention of secondary leaf fall.** Tropical Life 21: 165-166. 1925.—The article is an extract from the annual report for 1924-1925 of H. ASHLANT, published in the Bulletin of the Rubber Growers Association. The results of the season's operations are held to have demonstrated conclusively the practicability of spraying rubber trees as an ordinary estate measure. Whether retention of the foliage increases the yield of rubber has not been proved, but it has been shown that it will increase the growth of young trees by $\frac{1}{2}$ inch in girth per year over that of unsprayed trees.—*H. N. Vinall.*

3063. ANONYMOUS. **Scottish Plant Registration Station.** Scottish Jour. Agric. 6: 336-338. 1923.—A committee has been appointed in Scotland for the registration of stocks of agricultural plants. The constitution and rules of management are published.—*H. V. Harlan.*

3064. ANONYMOUS. **Sugar beet growing in Scotland.** Scottish Jour. Agric. 8: 300-307. 1925.—An abstract of the report of the committee of the Scottish Council of Agriculture appointed to investigate the prospects of sugar-beet growing in Scotland.—*H. V. Harlan.*

3065. ANONYMOUS. **The floral parts of the potato as aids in the identification of varieties.** Scottish Jour. Agric. 7: 187-193. 1924.—The characters used are the peduncles and pedicels, calyx, corolla, fruit and pollen. There is variation in the daily blooming period and capacity for fruit and flower formation.—*H. V. Harlan.*

3066. ANONYMOUS. **The laying down of temporary pastures.** Scottish Jour. Agric. 6: 67-76. 1923.—Grass mixtures for temporary pastures.—*H. V. Harlan.*

3067. ANONYMOUS. **Varieties of maize.** Agric. Gaz. New South Wales 36: 693-696. 1925.—Varieties are recommended for different provincial districts and subdistricts of New South Wales, on the basis of early and main crops.—*L. R. Waldron.*

3068. ANONYMOUS. **Wheat studies of the Food Research Institute.** Wheat Studies 1: viii + 1-376. 33 fig. Stanford University, California, 1925.—This series of studies appeared in 10 issues between December, 1924, and September, 1925. It is designed to give an impartial review of the world wheat position and outlook, with due recognition of economic con-

ditions in exporting and importing countries. Each number contains a single article. The studies include such subjects as: The world wheat situation, 1923-1924; A review of the crop year; Developments in the wheat situation August to December, 1924; Developments in the wheat situation January to March, 1925; and Development in the wheat situation April to July, 1925; etc. No. 2 presents a selected bibliography of current sources concerning wheat supplies, movements and prices. Since it is limited to current sources, it does not include books or other monographs and deals only with the principal exporting and importing countries. No. 8 includes historical, statistical, economic and agronomic data, and an analysis of the physiographic conditions of Western Canada.—*Carl L. Alsberg.*

3069. ADAMS, A. B. Phosphatic fertilizers as manures for grass lands. Jour. Dept. Agric. Western Australia 2nd Ser. 2: 172-176. 1925.—This article describes the common commercial phosphatic fertilizers with reference to their chemical composition, commercial source, and comparative value. It is stated that with the exception of ground rock phosphate which is not suitable for general application, superphosphate supplies phosphorous at a cheaper rate per unit than any of the other fertilizers described. The article is to be continued.—*P. J. Olson.*

3070. ALLAN, H. H. Experiments on the top-dressing of old pastures. Feilding Agric. Coll. [New Zealand] Bull. 4. 1-9. 1925.—This bulletin continues for the year 1924 the observations on the pastures discussed in Bull. 2. [see Bot. Absts. 13, Entry 6852]. No further botanical changes of moment are recorded, but there has been a definite increase in the carrying capacity and feeding value of the treated plots.—*Author.*

3071. AMES, C. T. Report from Holly Springs Branch Experiment Station for 1923. Mississippi Agric. Exp. Sta. Bull. 220. 1-24. 1923.—Cotton variety tests as usual show that early varieties are more dependable than late varieties. Velvet beans in every row of corn decreased the yield 16.9 bushels to the acre while Ootootan soybeans reduced the yield very little.—*J. F. O'Kelly.*

3072. AYRES, W. E. Soybeans—Delta Branch Station 1921-1924. Mississippi Agric. Exp. Sta. Bull. 227. 1-39. Fig. 1-15. 1925.—A general historic survey of the soybean crop in Mississippi with results of certain experiments at the Delta station.—Soybeans in corn decreased the corn yield considerably in 1923 but the corn crop in 1924 was increased 48.8%, which is greater than can normally be expected. In yield of hay, varieties ranked as follows: Ootootan, Biloxi, Mammoth Yellow, Virginia, Laredo, and Wilson. In yield of seed these varieties ranked as follows: Biloxi, Mammoth Yellow, Ootootan, Laredo, Virginia, and Wilson. Insect and disease pests are listed and described.—*J. F. O'Kelly.*

3073. BARTELS, L. C. Irrigation experiments at Werribee. Jour. Dept. Agric. Victoria 22: 37-42. 1 fig. 1924.—Gives a report on the irrigation of alfalfa over a period of 2 years.—*Wm. E. Lawrence.*

3074. BELLENOUX, E. SERRANT. Cent mille kilos de pommes de terre à l'hectare. [One hundred thousand kilos of potatoes to the hectare.] 80 p. C. Amat: Paris, 1923.—The author claims that it is possible to produce 100,000 or more kilos per ha. provided the crop is properly grown. The necessity of selecting soil well adapted to the crop, its proper preparation, fertilization, and subsequent cultural care are emphasized. Special consideration is given to the choice of varieties and to the use of high grade seed. It is suggested that the rows be spaced 70 cm. apart and the sets planted 40 cm. apart in the row. Use of whole sets (tubers) weighing 350-400 gm. is recommended. If smaller tubers must be used it is suggested that 2 sets averaging about 300 gm. be planted together. With spacing of rows and sets as given above and the use of tubers averaging 350-400 gm. it would require 34,987 sets per ha. and if the sets averaged 375 gm. it would be necessary to use 28,924 pounds of seed or about 482 bushels per ha. The data given on yield from the author's own experiment are apparently based on the performance of 3 plants which produced 8.2, 9.1 and 11.25 kgm. per plant. Mention is made of 3 fields which were claimed to have yielded at the rate of 90,000 kgm. per ha. but the size of the fields are not specified. The following kilo applications of chemical fertilizers are recommended per ha.: 340 of nitrogen, 190-200 of phosphoric acid, 560 of potassium and 200 of lime. A brief discussion on the manufacture of alcohol from potatoes is given in the including chapter.—*W. Stuart.*

3075. BISHOP, R. O., AND E. A. CURTLER. **A preliminary note on pineapple fiber.** Malayan Agric. Jour. 13: 293-301. 1925.—An account of yield and quality of fiber extracted from leaves of locally cultivated plants of *Ananas sativa*, of which the fruits are used for canning. The fiber is of good quality, but the cost of collection and extraction is high.—*R. E. Holtum*.

3076. BISHOP, R. O., AND E. A. CURTLER. **Preliminary note on Manila hemp.** Malayan Agric. Jour. 13: 125-138. 1925.—A general account of the cultivation of *Musa textilis* is given with particulars of fiber extraction. Notes on locally grown plants and fiber, and a comparison between local fiber and that from the Philippines, are given. Local culture has not hitherto been very successful.—*R. E. Holtum*.

3077. BORODIN, D. N. **Introducing American corn in Russia.** Seed World 17¹³: 22-23. 1925.—A brief statement regarding the American varieties of corn found best adapted to different sections of Russia as shown on a map accompanying the article. Besides corn, seed of various American forage crops, such as Sudan grass, tepary beans, Grimm alfalfa and various sorghums, have been sent to Russia for trial.—*A. J. Pieters*.

3078. BRIGGS, GLEN. **Leguminous crops for Guam.** Guam Agric. Exp. Sta. Bull. 4. 1-29. Pl. 14. 1922.—The bulletin discusses the uses of legumes, their adaptation to soil and climatic conditions of Guam, cultural methods, harvesting, feeding value, and varieties tested, including several varieties of cowpeas (*Vigna sinensis*), velvet beans (*Stizolobium* spp.) and soybeans (*Glycine soja* or *Soja max*), as well as pigeon pea (*Cajanus indicus*), peanut (*Arachis hypogea*), Jack bean (*Canavalia ensiformis*), Mungo bean (*Phaseolus aureus* or *P. mungo*), alfalfa (*Medicago sativa*), chochomeco (*Phaseolus lunatus* sp.), and the following native legumes: "Cerebilla" (*Dolichos lablab*), "Seguidilla" (*Psophocarpus tetragonoloba*), "Fijole" (*Vigna sinensis*), "Tangantangan" (*Leucoena glauca*), "Camachile" (*Pithecolobium dulce*), "Aromo" (*Acacia farnesiana*), yam bean (*Pachyrhizus tuberosus*), creeping tick-trefoil (*Desmodium triflorum* and *D. heterophyllum*), "Algaroba" (*Prosopis juliflora*), bur clover (*Medicago hispida*) and kudzu (*Pueraria thunbergiana*). Cowpeas and velvet beans did well and many of the others are promising, but alfalfa has failed.—*H. L. Westover*.

3079. BRIGGS, GLEN. **Para and Paspalum: Two Introduced Grasses of Guam.** Guam Agric. Exp. Sta. Bull. 1. 1-44. Pl. 6. 1921.—The bulletin discusses soil and climatic conditions in Guam and emphasizes the need for introducing new grasses and forages, due to the fact that the native species have a poor feeding value. Very satisfactory results have followed the introduction of Para grass (*Panicum barbinode*) and Paspalum grass (*Paspalum dilatatum*). Uses, adaptation, cultural methods, and feeding value are discussed in detail.—*H. L. Westover*.

3080. BRIGGS, GLEN. **The Sorghums in Guam.** Guam Agric. Exp. Sta. Bull. 3. 1-28. Pl. 9. 1922.—The bulletin discusses the climatic conditions in Guam and touches upon the classification of the sorghums, giving the main characteristics of about 26 varieties and stating briefly the results secured with each in the experiments. The highest yielding grain varieties were Blackhull kafir, Dwarf hegari, Dawn kafir, and feterita. The highest forage yields of non-saccharine sorghums were made by Dwarf hegari, White milo, Schrock sorghum,⁶ and Yellow milo. Of the sweet sorghums Red amber and Black amber gave the highest yields of grain and forage. Drought, adaptation, cultural methods, feeding value, diseases, and insect pests are discussed in detail.—*H. L. Westover*.

3081. BRIGGS, GLEN. **Vegetable Growing in Guam.** Guam Agric. Exp. Sta. Bull. 2. 1-60. Pl. 17. 1922.—This bulletin first discusses rather generally the soil and climate of the island; sources of seed, preserving seed; longevity of seed; manures and fertilizers; seed bed preparation; planting with reference especially to time, rate, and methods; thinning and transplanting; cultivation and irrigation; windbreaks; and insect enemies, fungus diseases, animal pests and means of controlling each. This is followed by detailed cultural directions for practically all the common vegetables and some that are rather uncommon. Suitability to Guam conditions and uses of each are discussed briefly.—*H. L. Westover*.

3082. BROWN, B. A., AND W. L. SLATE, JR. **Miscellaneous experiments with potatoes.** Storrs [Connecticut] Agric. Exp. Sta. Bull. 126. 27-41. 1925.—A number of short-time experiments are reported. Leafroll is reported to reduce potato yields more than mosaic. Spindle tuber is shown to reduce yields inversely with infection. Spraying experiments are

reported but are not consistent in giving increased yields. Certified seed has consistently given better yields than uncertified seed from the same general source. Sources of seed are compared. In a 1-year test, Peruvian Guano was a poorer source of nitrogen than animal tankage.—*Henry Dorsey*.

3083. BROWN, B. A., AND W. L. SLATE, JR. **Soybeans in Connecticut.** Storrs [Connecticut] Agric. Exp. Sta. Bull. 129. 255-287. 1925.—Tests of soybeans for a period of 7 years are reported. Yields of many varieties; amount of protein, dry matter, fat, fiber and nitrogen free extract; comparative yields of Golden millet, Japanese millet and Sudan grass; and a tabular description of the varieties grown, are given. The uses of the crop in the state and the factors entering into its culture, are discussed.—*Henry Dorsey*.

3084. BROWN, B. E. **Comparison of potato yields secured on different soil types with and without fertilizer.** Potato News Bull. 2: 472-475. 1925.—The results for 3 years are given, comparing no fertilizer with various applications of a 4-10-6 mixture on different soil types in Maine, New York, Pennsylvania, New Jersey and Virginia.—*F. Weiss*.

3085. BROWN, B. E. **Potash in relation to potato production on a number of soil types.** Potato News Bull. 2: 494-498. 1925.—Results of 3 years' experiments on different soil types in the northeastern states are given to show the general value of potash in fertilizing potatoes. This is expressed as a percentage of the total increase due to the use of a complete fertilizer and varies from 21 to 78%. The amount of potash that is profitable varies somewhat in the different sections.—*F. Weiss*.

3086. CALLANDER, W. F., LEWIS B. FLOHR, JOSEPH A. BECKER, AND G. B. L. ARNER. **Agricultural Statistics.** U. S. Dept. Agric. Yearbook 1924: 559-836; 1005-1113. 1925.—Statistical reports of the bread grains, other grains, fruits and vegetables, crops other than grains, fruits and vegetables, forestry and forest products, exports and imports of agricultural products, and miscellaneous agricultural statistics.—*C. J. Shirk*.

3087. CAMPBELL, H. **Hubam clover.** Cyprus Agric. Jour. 20: 84-85. 1925.—The author presents the results of his experience with Hubam clover in England for the 3 years 1922-1924. Seasonal variation very materially affected the character of the growth. The clover did not behave as well in a cloudy, rainy season as in a bright sunshiny one; it seems to thrive best on hot dry soil. The author believes that when Hubam clover is grown for seed it should not be broadcast but sown in drills so as to permit 1-2 cultivations to keep down weeds.—*W. Stuart*.

3088. CARNE, W. M., AND C. A. GARDNER. **Bathurst burr (*Xanthium spinosum* L.).** Jour. Dept. Agric. Western Australia (2nd. ser.) 2: 251-253. 2 fig. 1925.—A discussion of the objectionable features of this plant which is said to be the worst of the noxious weeds found in Western Australia, together with a description of the plant and suggestions as to methods of control.—*P. J. Olson*.

3089. CARNE, W. M., AND C. A. GARDNER. **White clover (*Trifolium repens* Linn.).** Jour. Dept. Agric. Western Australia (2nd. ser.) 2: 203-205. 1 fig. 1925.—Attention is called to the value of this plant as a pasture crop in those sections of Western Australia, where the soil is moist throughout the year. The crop is recommended for growing either alone or in mixture with other plants. Definite recommendations are made as to such mixtures, together with suitable rate, time and method of sowing. A botanical description of the plant is included.—*P. J. Olson*.

3090. CARR, W. A. C. **Short-term leys as an aid to arable farming.** Jour. Ministry Agric. Great Britain 31: 14-20. 1924.—The advantages arising from the inclusion in the rotation of some temporary pasture of 2-3 years duration are discussed, particularly as affecting the character of the soil and the yields of subsequent crops. Seeding and treatment of such temporary pastures are discussed in some detail.—*H. L. Westover*.

3091. COCKAYNE, A. H. **Hill country grassland in the North Island.** New Zealand Jour. Agric. 31: 80-88. 1925.—Methods of controlling second growth and of increasing productiveness of cut over land are discussed.—*N. J. Giddings*.

3092. COHEN STUART, C. P. **Iets over de geschiedenis der Lantana (*saliara*). [Notes on the history of Lantana.]** Thee 5: 109-114. 1924.—The history of the introduction of *Lantana Camara* into the Dutch East Indies is given, together with a bibliography. The

author does not agree with the opinion common in tropical countries which condemns this plant as a nuisance on agricultural land. It is a problem in the Dutch East Indies only where it is desired to develop forests or fodder grass.—*Carl Hartley*.

3093. COX, J. F., AND J. R. DUNCAN. **Corn growing in Michigan.** Michigan Agric. Exp. Sta. Bull. 289. 1-46. Fig. 1-36. 1920.—A discussion of the varieties of maize best adapted to different sections of Michigan, followed by a discussion of the methods of saving, storing and testing seed corn, and the best cultural practices. A note is given on corn smut, prepared by G. H. COONS, rotation being advocated. Methods of corn improvements are discussed.—*Ernst A. Bessey*.

3094. DAVIS, P. N. **Growing and fertilizing potatoes on muck soils.** Potato News Bull. 2: 486-488. 1925.—This bulletin describes the practice as regards rate and manner of application that was evolved in the Hollandale, Minnesota, district. Six hundred pounds per acre of a 0-9.5-27.5 mixture is applied in the row, or 1000 pounds broadcast for 2 seasons and thereafter 400 pounds applied in the row. Nitrogen decreases yields, but turning under a green crop favors bacterial action. Fertilizing increases frost resistance.—*F. Weiss*.

3095. DODDS, H. H. **Note on the flowering of sugar cane.** South African Sugar Jour. 9: 551. 1925.—While cane flowering or arrowing is usually associated with prolonged drought in Natal, the predisposing condition in the many recent cases appears to be the sudden change to dry and cool atmospheric conditions following unusually abundant and prolonged rains and high temperatures. It would appear desirable to cut flowering cane as early as convenient after arrowing. Uba cane is usually and perhaps invariably male sterile, however, hybrids of Uba with other varieties have been obtained, notably in Cuba, Hawaii, Jamaica, and Brazil.—*Nellie E. Fealy*.

3096. DOWNING, R. G. **Experiments in the renovation of Paspalum.** Agric. Gaz. New South Wales 36: 764. 1925.—The 2 treatments, 200 pounds of basic superphosphate, and of superphosphate applied to plats which had been well cultivated, gave the best results.—*L. R. Waldron*.

3097. DUYSSEN, FRANZ, UND EDUARD EGGLHUBER. **Unkrauter (Weeds).** 114 p. 59 fig. Walter de Gruyter & Co.: Berlin, 1925.—A book on German weeds for Germans, discussing weeds, of which 2 are cryptogams (*Equisetum arvense* and *E. palustre*), 12 are monocotyledons and the others dicotyledons. Of the dicotyledons, 25 belong to the Compositae and only 2 leguminous plants, *Vicia hirsuta* and *V. tetrasperma*, are rated as weeds. The method of treatment is nearly uniform and consists of a description with illustration, notes on occurrence, distribution, damage caused and eradication. In some cases special uses are given, as the isolation of the alkaloid, colchicin, from *Colchicum autumnale*. Many of the minor weeds are dismissed with a brief description.—*A. J. Pieters*.

3098. EDWARDS, H. T. **Production of henequén fiber in Yucatan and Campeche.** U. S. Dept. Agric. Dept. Bull. 1278. 1-20. Fig. 1-10. 1924.—Henequén fiber constitutes the main source of supply of the raw material used for the manufacture of binder twine. Practically all of the henequén fiber imported into the U. S. A. is obtained from Yucatan and Campeche. Plantation organization and management in Yucatan, and the conditions under which henequén fiber is produced are discussed.—*Author*.

3099. EWALD, UND CLAUSSEN. **Der Stickstoffdüngung der Milchviehweiden.** [The nitrogenous fertilization of dairy pastures.] Wiener Landw. Zeitg. 75: 367-368, 376-377. 1925.—The number of days of pasturage was increased by applications of 150 to 300 kilos of ammonium sulphate to the extent that from 800 to 2000 liters more milk was obtained. This should preferably be supplied in 2 or more applications, not limited to 1 application in the spring.—*F. Weiss*.

3100. FANTO, R., UND R. HERZNER. **Studien über Getreidemehle. III Mitteilung.** [Studies on cereal flours.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 49: 153-163. 1925.—A report of results of experiments in the problem of the variation in clarity of mixtures of liquid extracts of various kinds of flour of wheat, barley, rye, buckwheat, and corn. Probable causes of the variations are given, also tables showing ash and protein contents of extracts and extract mixtures.—*W. B. Lydenberg*.

3101. FAWCETT, E. J. **Goats and blackberry control on hill country.** New Zealand Jour.

Agric. 31: 9-12. 4 fig. 1925.—Angora goats have been found effective in keeping down blackberry bushes.—*N. J. Giddings*.

3102. FELDT. Klee-grasmischungen für kurzfristige Nutzung. [Clover-grass mixtures for brief period utilization.] Mitteil. Deutsch. Landw. Ges. 40: 1003-1006. 1925.—Suggestions as to the best mixtures, such as red, alsike and white clover, with black medic and grasses, especially timothy.—*A. J. Pieters*.

3103. FIORI, A. Il Trifoglio squaroso da ottimi risultati in Australia: perché non si coltiva questa foraggera in Italia? [Trifolium squarrosum gives good results in Australia: Why is it not cultivated for forage in Italy?] L'Alpe 12: 267-270. 1 fig. 1925.—*T. squarrosum*, formerly tried in Italy with promising results, has been shown also in Australia to have a notable precocity of growth, large production of the herbaceous parts and resistance to the humidity and rigor of winter, being able thus to replace *T. alexandrinum* and *T. incarnatum*. Its area of distribution indicates its adaptation to diverse soils with production of good and abundant spring forage. The botanical characters of this species and its botanical affinities with *T. alexandrinum* are indicated.—*R. Ciferri (translated)*.

3104. FITTS, O. B. Converting established turf to creeping bent by broadcasting stolons and top dressing. Bull. Green Sect. U. S. Golf Assoc. 5: 223-224. 1925.—Old turfs of fescue, South German mixed bent and various other grasses have been changed to Metropolitan and Washington creeping bent in 2 weeks time by scattering chopped up stolons of the latter grasses over the old turf and top dressing with about 1 cubic yard of compost to each 2000 square feet. Usually the only special care necessary has been to water the new planting frequently until the stolons have become rooted.—*L. W. Kephart*.

3105. FITTS, O. B. How to prevent or overcome grainy and fluffy conditions of turf in vegetative greens. Bull. Green Sect. U. S. Golf Assoc. 5: 195-196. 1925.—The tendency of the grass to form a flat radiating effect or a loose fluffy texture can be prevented by constant close cutting and by frequent top-dressing with compost and ammonium sulphate. If either condition has already developed it may be corrected by raking and very close mowing.—*L. W. Kephart*.

3106. FITTS, O. B. The vital importance of top dressing in the maintenance of satisfactory creeping bent greens. Bull. Green Sect. U. S. Golf Assoc. 5: 242-245. 5 fig. 1925.—A top dressing of sifted compost once a month is absolutely essential in maintaining the firm, close turf desired on a putting green. Without the compost a bent grass sod becomes loose and puffy, is impossible to cut satisfactorily and is almost useless for putting. Detailed directions are given for preparing and applying the material.—*L. W. Kephart*.

3107. FITTS, O. B. Water as an essential in growing and maintaining good turf. Bull. Green Sect. U. S. Golf Assoc. 5: 206-207. 1925.—Grass which is kept cut short, as on a putting green, always has short roots. Contrary to popular belief the roots are not made longer by heavy infrequent watering. Short grass should be watered lightly every day. Longer grass has longer roots and is able to utilize the water from occasional heavy soaking.—*L. W. Kephart*.

3108. GARNER, E. S. Kikuyu grass. Bull. Green Sect. U. S. Golf Assoc. 5: 252-253. 1925.—*Pennisetum clandestinum* is a strong, creeping, perennial grass from Uganda, Africa. It is distinctly a rich land grass and requires an abundance of warmth and moisture. In the U. S. A. it has been found adapted only to Florida, the Gulf coast, southern Texas and the warmer parts of Arizona and California. As a forage grass it is more palatable and nutritious than Bermuda grass and is said to have a higher protein content than alfalfa. As it withstands grazing well, it appears to have great possibilities as a pasture grass. It is not adapted to fine lawns and golf courses because the soft matted turf is 4 or more inches thick.—*L. W. Kephart*.

3109. GASSNER, G. Der Einfluss des Klimas auf die Erntebeschaffenheit des Getreides. [The influence of climate on the condition of cereals at harvest.] Mitt. Deutsch. Landw.-Ges. 40: 950-955. 1925.—The seed coat is little affected directly by climatic conditions, but high temperatures and low humidity at harvest time results in excessive and rapid drying, which favors cracking of the coat and consequent injury from seed-treating solutions. In barley and oats the percentage of glume is relatively higher when grown in hot, dry localities, than

in cool, moist ones. Freshly harvested seed do not have full germination maturity; the degree of such maturity is largely determined by climatic conditions. Furthermore, full germination capacity is attained more quickly in winter than in spring sorts. Seed at the milk and yellow-ripe stages require relatively lower temperatures for germination than fully-matured seed, but "green-ripe" seed, in contrast, germinate better at higher temperatures. Hot, dry weather preceding harvest, results in substantially better matured seed than cool, humid weather. Temperature and humidity conditions determine the moisture and protein content of wheat at harvest. In breeding wheat for a combination of high yield and high protein content, for cool, moist regions, comparative determinations should be made (1) of the absolute nitrogen-formation capacity of different wheat sorts, and those selected which have the highest capacity; and (2) of the conditions under which nitrogenous substances are transformed into protein, and those selected which have the highest capacity in this respect under unfavorable climatic conditions. In order to make progress, plant breeding must be founded more fully than heretofore to knowledge of the physiological processes, such as those obtaining in the relationship between climate and the quality and condition attained by grain at the time of harvest.—*C. E. Leighty*.

3110. GERALDES, C. DE MELLO. *Le sisal au Mozambique*. [The sisal of Mozambique.] *Rev. Bot. Appl. et Agric. Coloniale* 5: 500-509. 1925.—The cultivation of sisal (*Agave sisalana*) was begun in Mozambique in 1904. It has developed rapidly since 1911, the exports of fiber increasing from 104 metric tons in 1911 to 3,178 metric tons in 1922. The plants grow well on sandy loam soils containing little lime, and with an annual rainfall ranging up to 7,000 mm. On some plantations the flower stalks are cut and on others not. The results indicate that removing the flower stalk does not prolong the life of the plant as is often asserted, but it tends to promote a more vigorous growth in the last crop of leaves. The leaves often attain a length of 2 m.—*Lyster H. Dewey*.

3111. GERLACH, UND GÜNTHER. *Die Bewässerung der Kartoffeln*. [Irrigating potatoes.] *Mitteil. Deutsch. Landw. Ges.* 40: 940-941. 1925.—An experiment on irrigating lupines made in 1924 and which resulted in a large increase in green matter on the irrigated area, was followed in 1925 by a similar trial with potatoes. Four varieties were used and 94 mm. of water were applied by sprinkling. The average increase for the 4 varieties of potatoes was 60.4 D.Z. (hundred-kilos) per ha.—*A. J. Pieters*.

3112. GIBB, R. SHIRRA. *The management of hill grazings*. *Scottish Jour. Agric.* 53: 266-274. 1922.—Occasional grazing with cattle was found to maintain a more desirable vegetation than with sheep alone. Seasonal grazing was also of advantage.—*H. V. Harlan*.

3113. GORE, HOWARD M. *The year in agriculture*. U. S. Dept. Agric. Yearbook 1924: 1-96. *Fig. 2-27*. 1925.—The secretary's report to the president of the U. S. A. covering the activities of the Department of Agriculture and the state of agriculture in the U. S. A. for 1924.—*C. J. Shirk*.

3114. GRIFFING, J. B. *Cotton culture*. Univ. Nanking, Agric. and Forest. Ser. 13: 1-13. 1920.—Methods for the cultivation of American cotton in China, partly from the standpoint of American methods and partly as a result of experiments at the University of Nanking are discussed. Many methods used in the cultivation of Chinese cotton should not be used with American cotton. American varieties require a longer time to mature and should be planted at the beginning of the planting period for Chinese cotton. In the dryer regions of North China seed bed preparation and planting methods are similar to those in the semi-arid regions in the U. S. A., but for the very humid regions with a high summer rainfall it is recommended to work the soil up into beds with a ditch on each side and wide enough to plant 3-5 rows. Frequent cultivation to destroy weeds and to aerate the soil is recommended, from the time the seed is planted until the plants have attained sufficient size to prevent working without injury. The method of thinning used is the "single stalk" system of O. F. Cook. Thinning is not begun until the plants are nearly a foot high for the reason that a thick stand prevents the production of basal, vegetative branches. Due to the cheapness of labor in China, picking should begin as soon as any bolls are ripe and should be often enough to prevent any dropping of the bolls. In regions having a mild winter it is suggested that such crops as wheat and field peas be sown during the picking season as a green manure crop. When picking is

completed the old stalks may be pulled and used for fuel, an item of great importance in China.—*R. H. Porter.*

3115. GRIFFING, J. B. I. Report of three years' cotton improvement work. II. Observations on the behavior of cotton plants, especially during acclimatization. Univ. Nanking, Agric. and Forest. Ser. 1⁶: 1-45. *Fig. 1-14.* 1923.—A general survey of the cotton situation in 5 provinces of China, well adapted to the growth of cotton, showed that attempts to introduce foreign cotton had failed because the cotton had not first been acclimatized. By careful study of 12,500 plants by roguing of undesirable plants and by selection, 1 strain of Acala and 1 of Trice have been developed which are well adapted to certain semi-arid cotton-producing areas of China. Three new improved varieties of Chinese cotton have been developed, 1 of which has a lint quality practically equal to American cotton. In the acclimatization work it was observed that the change of environment apparently threw the plants into a mutating condition manifested in part in the 2 strains from Acala and Trice, which are markedly different from their parent stock but which breed true. Studies of seed and lint showed a positive correlation between lint index and size of seed, but no correlation between lint strength and size of seed.—*R. H. Porter.*

3116. GRIFFING, J. B. Roguing of cotton. Univ. Nanking, Agric. and Forest. Ser. 1²: 1-8. *Fig. 1-6.* 1920.—The degeneration of American cotton and especially the variety, Trice, which has been introduced into China, is discussed. After 3 years of cultivation without selection it becomes inferior to the average Chinese cotton and is treated as a weed by the Chinese farmer. Degeneration is manifested by the lack of uniformity of type. Great emphasis is placed on roguing out undesirable plants as a means of maintaining pure varieties which are much superior to Chinese cotton. Plates illustrate the types to rogue out and to save. The desirable characteristics for Trice are medium height with compact structure and short internodes; a fruiting branch from each node; and abundance of blossoms and bolls which have 5 lobes, broad at the base and tapering toward the apex; and earliness, as shown by the stage of maturity at the time of observation. Undesirable characteristics are tall, late maturing, spindling plants with a small number of bolls, together with excessive vegetative growth.—*R. H. Porter.*

3117. HANSEN, W. DIETRICH, UND H. VOGEL. Stärkegewinnung aus Kartoffeln ohne Verlust an Nährstoffen. [Starch extraction from the potato without loss in nutrients.] Mitteil. Deutsch. Landw. ges. 41: 12-17. 1926.—The authors briefly describe a starch extraction machine which from chemical analyses of the residual pulp and from actual feeding tests with cattle is particularly efficient in extracting starch without serious loss in other nutrient material.—*J. W. Wellington.*

3118. HANSEN, K. Planteavlén. 1924. [Plant culture. 1924.] Tidsskr. Landøkonomi 10: 453-476. 1925.—This annual review of Denmark's agricultural production for 1924 points out variations in standard rotations due to weather conditions, etc., and gives statistics regarding the production of the principal crops, together with amounts of fertilizers imported during 1924.—*Albert A. Hansen.*

3119. HANSON, HERBERT C. Distribution of Arizona wild cotton (*Thurberia thespesioides*). Arizona Agric. Exp. Sta. Tech. Bull. 3. 49-59. *Fig. 1-3.* 1923.—The bulletin gives the description and distribution of wild cotton and the wild cotton boll weevil in Arizona,—of considerable importance since it has been proved that the wild cotton boll weevil will infest and damage cultivated cotton.—*H. L. Westover.*

3120. HARDENBURG, E. V. The influence of soil type on seed potatoes. Potato News Bull. 2: 464-466. 1925.—Experiments are in progress to determine the relative value for seed of potatoes grown in light, heavy and muck soils, respectively. Evidence to date indicates the superior yielding capacity of muck- and upland-grown potatoes, and these also have whiter flesh, greater mealiness and better flavor than potatoes from heavier soils. The prejudice against muck-grown potatoes is not warranted.—*F. Weiss.*

3121. HARDENBURG, E. V. The status of fertilization in New York. Potato News Bull. 2: 457, 460-461. 1925.—This paper discusses fertilizing of potatoes in Long Island where potatoes are cultivated continuously on light soil with the use of green manures, and in other parts of the state where the soil is heavy and a rotation is practiced. The limited need for

potash, and the great need for phosphate and for deep working of fertilizer are emphasized.—*F. Weiss.*

3122. HAWKINS, R. S. The efficiency of legume inoculation for Arizona soils. *Ariz. Agric. Exp. Sta. Tech. Bull.* 4. 62-85. *Fig. 1-8.* 1923.—In the experiments discussed, inoculation was beneficial to alfalfa in most instances at the Sulphur Spring Valley Dry-Farm, but not at the Salt River Valley Experiment Farm. Increase in yield of vetch due to inoculation has been very marked at the Yuma Mesa Farm. In pot experiments inoculation hastened the maturity of alfalfa and increased the percentage of roots and tops. It increased the weight of tops and roots of all plants experimented with and increased the weight of the nitrogen in the tops of alfalfa, cowpeas and soybeans. Nodules from bacteria already in the soil were found to be larger than those produced by commercial cultures. Nodules were found to be much less abundant during the hot summer months than in cool weather.—*H. L. Westover.*

3123. HENRY, A. J., J. B. KINCER, H. C. FRANKENFIELD, W. R. GREGG, B. B. SMITH, AND E. N. MUNNS. Weather and agriculture. *U. S. Dept. Agric. Yearbook* 1924: 457-559. *Fig. 1-44.* 1925.—A general presentation of the important weather factors and a discussion of these factors in relation to the requirements of each of the cereal crops.—*C. J. Shirk.*

3124. HEUSER, OTTO. *Der deutsche Hanf.* [German hemp.] *Bücherei der Faserforschung.* III Bd. 92 p. S. Hirzel: Leipzig, 1924.—A history of hemp culture and its development in Germany, with the following main headings: The hemp plant; origin, description, cultural varieties, and structural, chemical and physical characteristics. Growing hemp; climatic relations, fertilizing, cultivating, harvesting, yield, and preparation of fiber. Economical significance of hemp culture. Bibliography.—*W. L. Lydenberg.*

3125. HILGENDORF, F. W. Improved strains of New Zealand oats. *New Zealand Jour. Agric.* 31: 93-97. 1925.—Varieties tested were College Algerians, Duns and Danish. Improved strains have been secured by breeding and selection.—*N. J. Giddings.*

3126. HINKLE, S. F. Fertility and crop production. 338 p. 80 fig. Sandusky, Ohio, 1925.—The point of view taken refers to the effect of various soil treatments on yields and the author has drawn freely on the work of American and Canadian experiment stations in support of the subjects discussed. There are 27 chapters, divided into continuously numbered paragraphs, together with appendix, bibliography and index. The chapter headings indicate the subject matter in each case as follows: Theories regarding fertility, building for high production, crop yields and profits, fertilizing crop and soil, systems of farming, drainage of farm land, irrigation, liming the land, rates of liming crops, utilizing manure, reinforcing manure, composting manure, legumes, comparative value of legumes for soil improving, comparative yield of legumes, rotation-effect of crops on others, green manures and crop residues, organic matter, tillage, frequency and depth of cultivation, depth of application of commercial fertilizers, fertilizer materials, nitrogen fertilizer carriers, comparison of phosphate carriers, carriers of potassium, complete fertility, sulfur and salt as fertilizers. With the exception of some legumes, briefly described because of their value as soil improvers, crops as such are not discussed. Copious references are made to the experiment station literature cited in full in the bibliography.—*A. J. Pieters.*

3127. HOLLAND, C. G. Winter treatment of Bermuda greens. *Bull. Green Sect. U. S. Golf Assoc.* 5: 249-250. 1925.—As the result of experiments at Danville, Virginia, the writer strongly recommends that in the northern part of the Bermuda belt, the Bermuda grass be covered from Christmas until the first of April with sand, rotten cotton, straw or some other material. Growth the following summer will be greatly superior to that on areas which were untreated or in which Italian rye grass was seeded to provide winter cover.—*L. W. Kephart.*

3128. HOUER, ING. Einige Grottenhofer Erfahrungen: Sortenanbau, Dünnsaat und Hackkultur bei Getreide. [Experiments in Grottenhof: Varietal tests, thin seeding and tillage of cereals.] *Wiener Landw. Zeitg.* 75: 360. 1925.—Results are given for summer barley and oats, and for winter wheat. Thin seeding with spring cultivation delayed tillering and exposed the crop to rust infection and the attack of haulm flies, but gave a larger yield than thick seeding. However, unless special cultivating implements are used, and cultiva-

tion is carried out so as not to delay tillering, the method would not normally be adaptable to this region.—*F. Weiss.*

3129. HUMPHRIES, A. E., AND ROBT. HUTCHINSON. Report on the quality of a new "form" of wheat, compared with selected Yeoman and older "forms" of English wheat. Jour. Nat. Inst. Agric. Bot. 1924: 9-18. 1924.—Results are reported of milling and baking tests of this new "form" of wheat later given the name of Yeoman II, as compared with other standard varieties grown at several experiment stations.—*H. L. Westover.*

3130. HUMPHRIES, A. E., AND ROBT. HUTCHINSON. Report on the quality of Red Fife wheat grown successively in England for twenty-one years. Jour. Nat. Inst. Agric. Bot. 1924: 3-16 (Suppl.). 1924.—A brief historical account of the efforts to improve the quality of English wheats is given. In early trials, Red Fife proved preëminent and it has been used extensively in the breeding work. Results of milling, baking and laboratory tests of the improved wheats grown at several different places are discussed.—*H. L. Westover.*

3131. HUTSON, J. B., AND E. L. LANGSFORD. Farming with bluegrass. Kentucky Agric. Exp. Sta. Bull. 259. 59-98. Fig. 1-4. 1925.—In the bluegrass section of Kentucky, bluegrass seed ranged from 3.6 to 12.5 bushels per acre, averaging 6.5 on 2,770 acres of bluegrass in 1923. A common rotation on large farms of central Kentucky is White Burley tobacco or corn 1-2 years, a small grain, and 2 years of clover sown with bluegrass and then left in bluegrass for 5-8 years. On small farms the rotation is usually corn or tobacco, a small grain and clover, and timothy for 2 years, with a small part of the farm often being left to bluegrass. If seed is the chief consideration in raising bluegrass, it is not pastured in the spring before stripping. If pasture is the consideration, it is usually pastured heavily from April or early May until hot weather, then lightly, and more heavily as the fall rains come on. Details of the management of a 568-acre blue grass farm for 1 year, and of a suggested organization for a 400-acre bluegrass farm, are given.—*W. D. Valleau.*

3132. JOHNSTON, C. J. R. Cotton-growing experiments. Jour. Dept. Agric. Victoria 22: 688-691. 1924.—These experiments show negative results as to cotton-growing in the Murray Valley, until an earlier maturing variety can be found.—*Wm. E. Lawrence.*

3133. KERLE, W. D., R. N. MAKIN, AND MARK H. REYNOLDS. Farmers' experiment plots. Potato trials, 1924 and 1925. Agric. Gaz. New South Wales 36: 765-776. 1925.—Yields are reported from 3 localities on a number of private farms. Various detailed notes are given. Potato growers have lately demanded new varieties to take the place of older sorts which are said to be "running out." Newly indorsed varieties, however, have not done so well as the standard sorts of the districts. Hill selection in the field at digging time is recommended to maintain the vigor and vitality of the variety.—*L. R. Waldron.*

3134. KEUCHENIUS, A. Indigofera Endecaphylla Jacq., een veelbelovende groenbemester. [Indigofera Endecaphylla Jacq., a promising green manure.] Thee 6: 5-7. 1925.—This perennial herb was first imported by seed into Java in 1923. Native in tropical and subtropical Asia and Africa, it occurs in Java neither naturally nor as an escape. The laterals have no tendency toward climbing, as do those of *Vigna Hisei* and *Calopogonium mucunoides*. It is being tested in all parts of Java and grows well up to elevations of 4000 feet. A detailed description of the plant and its behavior is given. No diseases have so far been observed, and it is considered very promising.—*Carl Hartley.*

3135. KEUCHENIUS, A. A. M. N. Botanische kenmerken en cultuurwaarde als groenbemester van een 60-tal nieuwe soorten van Leguminosen. [Botanical characters and cultural value as green manure of 60 new species of legumes.] Dept. Landb. Nijverheid en Handel, Mededeel. Proefsta. Thee Nederland.-Indië 90. 1-44. Illus. 1924.—It is best to grow in the same tea plantation a mixture of legumes as cover crop, hedges, and shade trees. Need for different sizes of plants in the same planting and for rotation in order to avoid the diseases and pests which attack green-manure plants both make it desirable that a number of different species of legumes be available. To diminish competition, the species used for the mixture should, if possible, have different habits as to the depth of root penetration. *Leucaena glauca* is known especially for its deep root system. *Tephrosia candida* has been replaced on nearly all Java plantations by *Crotalaria usaramoensis* and *C. anagyroides* because of its insect susceptibility. *Crotalaria striata*, *C. juncea* and *C. incana* were also satisfactory

at first but had to be abandoned because of insects which later attacked them; however, the first 2 are still regularly used in Ceylon. *Crotalaria usaramoensis* is attacked in Java by *Parodiella Spegazzinii*, *Septobasidium bogoriense*, *Corticium salmonicolor* and *Botryodiplodia Theobromae*. *Cassia hirsuta* and *Indigofera arrecta* are noted as new species which have done practically as well at Buitenzorg as *Crotalaria usaramoensis*. Botanical description, habit, seed production, root depth, vigor under little shade and under no shade, viability of the seed, abundance or root nodules, ability to withstand pruning, moisture, and drought, elevation range, disease and pest susceptibility, duration of life, and cultural value, are given in text and in tabular form for 2 species of *Abrus*, 3 of *Aeschynomene*, 2 of *Alysicarpus*, 2 of *Cantharosperrum*, 6 of **Cassia*, 3 of *Crotalaria*, 12 of **Desmodium*, 2 of **Indigofera*, 2 of *Mucuna*, 2 of *Phaseolus*, 2 of *Psophocarpus*, 3 of *Rhynchosia*, 2 of *Tephrosia*, 4 of **Vigna*, and for 1 species each of *Acacia villosa* Willd., **Calopogonium mucunoides* Desv., *Centrosema virginianum* Bth., *Clitoria ternatea*, L., *Flemingia lineata* Roxb., *Galactia tenuiflora* W. & A.; *Glycine Soja* Bth., **Mastersonia Bakeri* Back., *Pachyrrhizus erosus* Urb., *Pseudarthria viscida* W. & A., **Pueraria phaseoloides* Bth., *Shuteria vestita* W. & A., and *Teramnus labialis* Spreng. Plants illustrated are indicated by asterisks.—*Carl Hartley*.

3136. KINNEY, E. J. Steam sterilization as a possible means of controlling weeds on putting greens. Bull. Green Sect. U. S. Golf Assoc. 5: 232-234. 1925.—The writer suggests that the method of steaming practised on tobacco seed beds may be adapted to golf greens and lawns.—*L. W. Kephart*.

3137. KIRK, L. E. Self-pollination of sweet-clover. Sci. Agric. 6: 109-112. 3 fig. 1925.—*Melilotus alba* and *M. officinalis* were each allowed to set seed at will under 3 conditions: (1) In the open, (2) when entire plants were enclosed in insect-proof cotton cages, and (3) when individual racemes were enclosed in glassine bags. The average number of pods produced per raceme under these conditions were, respectively for *M. alba*, 66.43, 34.91 and 15.79; and for *M. officinalis*, 63.88, 2.6 and 0.04. From this it is concluded that *M. alba* is highly self-fertile whereas *M. officinalis* probably requires cross-pollination.—*L. W. Kephart*.

3138. KUO, TAN SIEN, AND FUNG MING CHOU. [The acclimatization of Acala cotton in China.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 10: 366-399. 7 pl., 6 fig. 1925.—The writers give a brief history of the introduction of American cotton seed into China, and point out some of the reasons which are responsible for the failure in introducing American cotton seed, such as too much difference in climatic condition, lack of purity in seed introduced, no mass selection practised when growing, and no definite plan of acclimatization, or of breeding. The origin of Acala seed used in this experiment is given and the cultural method and the 5-year plan of acclimatization practised are described. It is reported that Acala can be successfully acclimatized.—*Chunjen C. Chen*.

3139. [КУПРЕЕНОК, П.] Купреенок, П. Усвоение Азота Торфа Растениями. [The absorption of the nitrogen of peat by crops.] Труды Научного Инст Удобренья Выпуск Научно-Технически ии Отдел В.С.Н.Х. No. 22, 1-19, 1923. [Trans. Inst. Fertilizers] 19. 1-19. [Moscow]. 1923.—To oats grown in sand cultures were added different combinations of peat. Some cultures contained pure Sphagnum peat, and others contained various proportions of peat mixed with animal excrements. The results showed that the moss peat invariably increased to a great extent the nitrogen content of the substratum as well as of the plants that were grown therein.—*L. J. Pessin*.

3140. LAGORCE, JOHN OLIVER. Porto Rico, the gate of riches. Nation. Geog. Mag. 46: 599-652. 47 illus. (12 col.). 1924.—In a general description of country and peoples is included a discussion of various economic plant products and their manufacture, as sugar and coffee.—*W. M. Atwood*.

3141. LANGFIELD, J. H. Wheat experiments at the Merredin Experiment Farm. Jour. Dept. Agric. Western Australia 2nd ser. 2: 298-307. 3 fig. 1925.—The results reported cover (1) variety trials, (2) early versus late plowing for fallowing, (3) depth of plowing and (4) seasonable planting. In (1), 16 varieties were compared. The results are presented in tabular form, the results for 1923 as well as for 1924 being included. Some comments are offered as to soil differences in the trial plots. In (2), plowing on May 23 and August 26 were compared, results favoring the early plowing. In (3), 4-, 6-, and 8-inch plowing depths were

compared, results favoring the shallow plowing. In (4), planting on each of the dates, April 8, May 23, and June 16 were compared. The tabulated results show a great deal of fluctuations as between the several varieties used in the test, although in nearly all cases they favor the medium and late over the early planting dates.—*P. J. Olson*.

3142. LARUE, P. *La culture des prairies et les machines*. [Care of meadows and implements used.] *Prog. Agric. et Vitic.* 75: 231-234. 1920.

3143. LEVY, E. BRUCE. *The grasslands of New Zealand: Preliminary ecological classification of species*. *New Zealand Jour. Agric.* 30: 357-374. 1925.—A discussion of various factors influencing plant population and tables showing the tolerance of many grasses and clovers to conditions existing in certain New Zealand areas.—*N. J. Giddings*.

3144. LIVERMORE, J. R. *Hill-unit selection of potatoes*. *Potato News Bull.* 2: 421-422, 424-425. 1925.—This is a condensed account of results published in *New York State College of Agric. Ext. Bul.* 125. A method of maintaining cooperative seed plots in which hill-unit selection is practiced is described; and results from 3 years are given which indicate that it is possible, in the absence of disease as a factor, to isolate strains of potatoes that will outyield field-run stock.—*F. Weiss*.

3145. LOWE, G. N. *Fertilizer experiments with potatoes. Farmers' trials at Benger*, 1925. *Jour. Dept. Agric. Western Australia 2nd ser.* 2: 241-245. 1925.—As a result of this fertilizer trial the following conclusions are drawn: Potash is not a necessary constituent of a fertilizer required to produce the maximum yields obtained. The usual application of 15 hundred-weight of superphosphate is wasteful, 475 pounds being adequate in this experiment. Nitrogenous fertilizers are necessary for the best results on these soils, although the lighter dressings (350 pounds) are as effective as the heavier ones (500 pounds).—*P. J. Olson*.

3146. McCALL, T. M. *Potato culture and fertility practices in the Red River Valley*. *Potato News Bull.* 2: 488-491. 1925.—In this potato section the principal problems of fertilizing are the maintenance of proper physical condition of the soil and the determination of how much mineral fertilizer is profitable. Sweet clover gives best results as a green manure crop in preparation for potatoes, and a moderate application of phosphate, preferably broadcast, is generally profitable.—*F. Weiss*.

3147. McCaULEY, C. *Field experiments with cotton*. *Agric. Gaz. New South Wales* 36: 819-820. 1925.—Trials were conducted on 9 private farms. Plants spaced 6 inches apart in rows 4.5 feet apart gave the maximum yield of 570 pounds of lint per acre. Forty pounds of superphosphate per acre gave a considerably larger yield than 80 pounds of superphosphate or none.—*L. R. Waldron*.

3148. MAKIN, R. N. *Farmers' experiment plots. Green fodder trials*. *Agric. Gaz. New South Wales* 36: 737-739. 1925.—Trials of maize and sorghum for green fodder and silage purposes were carried out upon 11 private farms. Maximum yields of nearly 30 tons of sorghum were secured. When phosphorous was used, yields were generally considerably higher than those secured from unfertilized plots. Even when no additional tonnage was secured better leaf development and plant color were obtained.—*L. R. Waldron*.

3149. MARKS, G. E. *The production and flue-curing of tobacco*. *Jour. Dept. Agric. Victoria* 22: 435-443, 479-501. *Fig. 1-15*. 1924.—This article is a general treatment of the subject.—*Wm. E. Lawrence*.

3150. MAUME, L., ET J. DULAE. *Sur la période de toxicité de divers engrais azotés à l'égard du blé au début de sa végétation*. [The period of toxicity of various nitrogenous fertilizers with regard to the initial growth of wheat.] *Ann. École Nation. Montpellier* 18: 298-326. *Fig. 1-11*. 1925.—In pot experiments sodium nitrate; ammonium nitrate, carbonate, bicarbonate, chloride, and sulphate; galalith; urea; and hoof meal were tested. (1) In sand most of the fertilizers became toxic when applied at a rate greater than 30 kg. of N per ha. Urea and hoof meal were non-toxic even when applied at a rate of 120 kg. of N per ha. The results were practically the same whether the fertilizer was applied at or 15 days before the seed were sown. (2) In ordinary soil during the first 3 days of growth, ammonium carbonate, bicarbonate and sulphate, urea and hoof meal stimulated growth when applied at the rate of 30 to 60 kg. of N per ha. The action of the other fertilizers was either indifferent or toxic, but by the 13th day all fertilizers exerted a stimulating effect. None were toxic when applied

15 days before the seed were sown. (3) In garden soil the beneficial action was less marked with the organic than with the inorganic fertilizers. Ammonium chloride, nitrate and sulphate and nitrate of soda were toxic when applied in large doses, but this did not occur when the ingredients were applied 15 days before the seed were sown.—*F. F. Halma.*

3151. MAXTON, J. P., AND C. S. ORWIN. The maintenance of arable cultivation in Scotland. Jour. Ministry Agric. Great Britain 31: 744-749. 5 fig. 1924.—This article brings out the fact that during the past 50 years agriculture in Scotland has yielded fair wages to the workers and a margin of profit to its farmers, while during this period the industry in England has experienced severe depression. Agricultural statistics show that the decline in the area described as arable land has proceeded differently in Scotland as compared with England. The utilization of corn crops, rotation grasses, permanent and rotation grass and other crops in both regions are compared. Illuminating graphs are used to show comparative results.—*M. R. Burr.*

3152. MEGEE, C. R. Hairy vetch. Michigan Agric. Exp. Sta. Circ. 50. 1-8. Fig. 1-8. 1922.—An account of the soil and cultural requirements of hairy vetch (*Vicia villosa*) in Michigan.—*Ernst A. Bessey.*

3153. MESSEDAGLIA, LUIGI. Notizie storiche sul mais. Una gloria veneta. Saggio di storia agraria. [Historical notes on maize.] Quaderno Mensile Ist. Federale Credito Risorg. Venezie 37: 1-168. Fig. [Pl.] 1-19. C. Ferrari: Venezia, 1924.—The author discusses the various names that have been applied to maize; its first introduction into the old world; references to maize in Italian and other old-world botanical literature; maize in Italian herbaria and botanical gardens; the introduction and distribution of maize in the Venetian countryside, in Lombardy and Piedmont, in Emilia and Tuscany, and in France, Spain, etc.; the high place and merit of maize in the region around Venice; legends and fables about maize; and the relation of maize to pellagra.—*Frederick V. Rand.*

3154. MILSUM, J. N., AND E. A. CURTLER. Calopogonium mucunoides. Malayan Agric. Jour. 13: 271-272. 1 pl. 1925.—An account is given of this plant, which has been introduced as a cover crop. It is valuable as a wash preventive on newly opened undulating land.—*R. E. Holtum.*

3155. MONTEITH, JOHN, JR. Checking the growth of algae on greens. Bull. Green Sect. U. S. Golf Assoc. 5: 218. 1925.—The algae which sometimes cover the bare spots in turf caused by attacks of brown patch or by other conditions may be destroyed by spraying with mercuric chloride solution at the rate of $\frac{1}{4}$ pound to 50 gallons of water per 3000 square feet.—*L. W. Kephart.*

3156. MOOMAW, LEROY. Tillage and rotation experiments at Dickinson, Hettinger, and Williston, North Dakota. U. S. Dept. Agric. Dept. Bull. 1293. 1-24. Fig. 1-3. 1925.—The results of tillage and rotation experiments (1907-1923) at 3 stations in western North Dakota agree closely and conform to results of similar work at other stations in the area. An introductory section outlines the soil and climatic conditions and plan of the experiments. The highest yields of small grains were obtained on fallow. The importance of corn in the farm plan is emphasized by the fact that small grains yield almost as much on disked corn ground as after fallow. Corn is recommended to the extent that it can be utilized as feed on the farm. Yields of wheat at the 3 stations averaged 18.8 bushels on fallow and 16.5 bushels on disked corn ground. Oats averaged 40.3 bushels on fallow and 35.1 on disked corn ground, and barley averaged 28 bushels on fallow and 25.7 on disked corn ground. Both spring and fall plowing were about equally good as preparation for grains, but both gave yields somewhat below corn ground or fallow. Green manures did not promote any increases in yield which could be attributed to the effects of the organic matter plowed under. The yields following their use appeared to correspond very closely to those following late plowing of fallow land. The application of barnyard manure did not increase small grain yields but resulted in a substantial increase of corn fodder. Continuous cropping to small grains showed marked reductions in yields which seemed to be the result of weeds rather than of reduced fertility. The corn crop, which was kept free from weeds, showed an increase in grain yield but a slight decrease in the total weight when cropped continuously.—*Author.*

3157. MORRIS, D. C. Filtration of raw beet diffusion juice. Internat. Sugar Jour. 27:

479-482. 1925.—A series of experiments to determine the practicability of thorough filtration, essential to production of the highest grade of sugar, is described in detail.—*Nellie E. Fealy*.

3158. MULLETT, H. A. Dookie crop competition, 1923. Jour. Dept. Agric. Victoria 22: 153-164. 4 fig. 1924.—Fallowing methods and wheat diseases are discussed briefly for this region.—*Wm. E. Lawrence*.

3159. MULLETT, H. A. Dookie fallow competition. Jour. Dept. Agric. Victoria 22: 303-305. 1924.—The average yield of 50 bushels per acre was due to a "nicely adjusted combination of summer fallowing, good tillage of the fallow, by liberal dressings of good seed and heavy dressings of fertilizer, and, above all, by late sowing."—*Wm. E. Lawrence*.

3160. MULLETT, H. A. Nhill crop and [summer versus winter] fallow competitions, 1923. Jour. Dept. Agric. Victoria 22: 208-223. 9 fig. 1924.

3161. MULLETT, H. A. Rupanyup crop and fallow competitions [No. 5], 1923. Jour. Dept. Agric. Victoria 22: 291-295. 3 fig. 1924.—Advantages gained have been the use of improved seed, better tillage of the soil and heavier fertilization.—*Wm. E. Lawrence*.

3162. NEWTON, R., AND J. G. MALLOCH. Wheat quality and environment. Sci. Agric. 6: 14-26. Fig. 1. 1925.—Beginning in 1924, stock seed of 6 varieties of wheat has been sent to 6 experiment stations in western Canada for planting. The product is returned to the University of Alberta for examination as to its bread making quality. The present paper is largely a preliminary discussion of the technology of wheat milling; 56 references are given.—*L. W. Kephart*.

3163. NICHOLSON, G. Field experiments with maize. Grafton experiment farm. Lateness of cultivation trials, 1919-1925, summarized. Agric. Gaz. New South Wales 36: 703-705. 1925.—Yields were increased sufficiently by cultivating until tasselling time to show a sufficiently large net increase income to warrant recommending the procedure. The alternative method involved but 1 cultivation until hilling.—*L. R. Waldron*.

3164. NICHOLSON, G. Field experiments with maize. Grafton experiment farm. Rate of seeding experiments, 1919-25, summarized. Agric. Gaz. New South Wales 36: 777-779. 1925.—Trials were conducted with 4 rates of seeding, in rows 4 feet apart with 3 kernels planted per hill. Distances apart in the row were 20-inches, 28-inches, 32-inches, and 40-inches, respectively. Variations in yield were less than would be expected from ordinary experimental errors. Certain considerations favor the thinner planting.—*L. R. Waldron*.

3165. O'KELLY, J. F., AND ROLAND COWART. Cotton varieties and fertilizers, 1924. Mississippi Agric. Exp. Sta. Bull. 226. 1-12. 1 fig. 1924.—In an unusually dry season with little weevil damage, early, dwarf varieties could not surpass later kinds.—In a 4-year average, 15 pounds of nitrogen to the acre increased the yield of seed cotton 169 pounds when from nitrate of soda, 155 pounds from ammonium sulphate, 127 pounds from cyanamid, and 60 pounds from cottonseed meal. Where cotton rust was severe 200 pounds of kainit increased the seed cotton 562 pounds to the acre in a 2-year average.—*J. F. O'Kelly*.

3166. OLESON, G. O. Origin and history of Manshury-Oderbrucker Barley. Seed World 18*: 20-21. 1925.—An account of the introduction of this barley which is said to have been secured by Henry D. Grunow from one of the gardeners to the Emperor of Germany and to have been brought by Grunow to his home in Iowa County, Wisconsin, in 1861.—*A. J. Pieters*.

3167. PARKER, WILFRED H. Preliminary trials of lucernes. Jour. Nat. Inst. Agric. Bot. 1924*: 19. 1924.—In yield, beginning with the highest, the varieties of alfalfa ranked as follows: Provence, Kansas common, Grimm, Dakota common, South African, and Peruvian.—*H. L. Westover*.

3168. PARKER, WILFRED H. Report of trials of Yeoman II wheat, 1922-23. Jour. Nat. Inst. Agric. Bot. 1924*: 4-8. 1924.—Results are given of trials with Yeoman II Wheat at several experiment stations.—*H. L. Westover*.

3169. PATERSON, W. G. R. Rotation cropping. Trans. Highland and Agric. Soc. Scotland 34: 115-138. 1922.—Results of several years' work with rotations are discussed, showing that returns are easily secured from oats—turnips—hay, but that pasture results are much more involved.—*H. V. Harlan*.

3170. PATTERSON, T. H. Pasture top dressing trials at Te Kurmi. New Zealand Jour.

Agric. 31: 88-92. 1 fig. 1925.—Top dressing with phosphatic fertilizers has given excellent results.—*N. J. Giddings.*

3171. PIETERS, A. J. **Difference in internode lengths between, and effect of variations in light duration upon, seedlings of annual and biennial white sweet clover.** Jour. Agric. Res. 3: 585-596. 1925.—The effect of increasing or decreasing the length of the daily period of illumination was to increase or decrease the length of each internode in seedlings of *Melilotus alba* and of *M. alba annua*. The seedlings of *M. alba* were relatively more affected by the long day than were those of *M. alba annua*, an increase in the daily period of illumination tending therefore to wipe out the normal differences in length of internode between these forms.—*Author.*

3172. PIETERS, A. J. **Domestic vs. Foreign clover seed.** Seed World 15²: 13-14. 1924.—A summary statement of work by the U. S. Dept. of Agric. and the state experiment stations in a comparative study of domestic and imported red clover seed.—*Author.*

3173. PINN, A. J., AND G. NICHOLSON. **The sweet potato crop.** Agric. Gaz. New South Wales 36: 785-796. 9 fig. 1925.—This crop receives minor consideration in New South Wales although conditions are favorable for the growth of sweet potatoes. The subject is treated under the headings: Districts and soils, manuring and propagating, planting out and cultivation, harvesting and storing, and varieties. The variety, Southern Queen, gave a yield of over 8 tons per acre at Grafton for a 4-year average. Higher yields are recorded for stock varieties.—*L. R. Waldron.*

3174. PIPER, C. V. **Sweet vernal grass.** Bull. Green Sect. U. S. Golf Assoc. 5: 200-201. 1925.—Because of its sweet odor and its ability to grow on very poor land, sweet vernal grass has great merit as part of a mixture of grasses for the rough.—*L. W. Kephart.*

3175. PIPER, C. V., AND W. E. STOKES. **Centipede grass (*Eremochloa ophiuroides*).** Bull. Green Sect. U. S. Golf Assoc. 5: 196-197. 1925.—Centipede grass is a stoloniferous perennial grass introduced into the U. S. A. in 1919 from southern China. It has proved hardy south of a line from Wilmington, North Carolina to Shreveport, Louisiana, and is the best grass for lawns and fairways yet discovered for that region. In appearance it is intermediate between carpet grass and Bermuda grass. It seeds abundantly but so far has been propagated only vegetatively.—*L. W. Kephart.*

3176. PIPER, C. V., R. A. OAKLEY, H. N. VINALL, A. J. PIETERS, W. J. MORSE, W. J. SPILLMAN, O. C. STINE, J. S. COTTON, G. A. COLLIER, M. R. COOPER, E. C. PARKER, E. W. SHEETS, AND A. T. SEMPLE. **Hay.** U. S. Dept. Agric. Yearbook 1924: 285-377. Fig. 1-59. 1925.—A presentation of the history, the processes, and the importance of hay production and marketing.—*C. J. Shirk.*

3177. PITT, J. M. **Farmers' experiment plots. Maize trials, 1924-25.** Agric. Gaz. New South Wales 36: 780-782. 1925.—These trials were conducted upon 7 private farms. A total of 18 varieties were under trial. Maximum yields of over 100 bushels per acre were reported.—*L. R. Waldron.*

3178. PITT, J. M. **Farmers' experiment plots. Sweet sorghum trials, 1924-25.** Agric. Gaz. New South Wales 36: 803-806. 1925.—Thirteen varieties were under trial. Maximum yields were obtained from Sorghum 34, a local selection.—*L. R. Waldron.*

3179. PITT, J. M. **Mixed farming on the Middle rivers. The problem of maintaining fertility under heavy cropping conditions.** Agric. Gaz. New South Wales 36: 723-736. 4 fig. 1925.—Certain typical farms are described and discussed in some detail in showing how fertility under heavy cropping conditions can be maintained.—*L. R. Waldron.*

3180. PITT, J. M. **Seed maize contests.** Agric. Gaz. New South Wales 36: 685-692. 1925.—In these contests seed was furnished by different farmers and grown at 1 or more points in a region of uniform soil conditions for each contest. There were a total of 87 entries. In general, growing conditions were excellent and maximum yields of nearly 150 bushels per acre were secured. Names of many of the competitors with yields and varieties are shown.—*L. R. Waldron.*

3181. PROFEIT, W. J., AND W. M. FINDLAY. **Some factors affecting the value of potatoes or seed purposes.** Scottish Jour. Agric. 6: 54-63. 1923.—Effect of seed selection on disease and yield of potatoes.—*H. V. Harlan.*

3182. QUODLING, H. C. **Production of new varieties of wheat.** Queensland Agric. Jour. 23: 321-329. Pl. 51-60. 1925.—A number of varieties of wheat produced by R. E. Soutter are described and their properties in relationship to local conditions outlined.—*W. D. Francis.*

3183. RAMSAY, J. T. **Results of potato manuring trials.** Jour. Dept. Agric. Victoria 22: 415-420, 508-511. 1924.—Lime improved the quality of the tubers and lessened the loss from disease. The more expensive superphosphates gave higher returns than the cheaper.—*Wm. E. Lawrence.*

3184. REYNOLDS, MARK H., AND B. M. ARTHUR. **Farmers' experiment plots.** Agric. Gaz. New South Wales 36: 697-702. 1925.—Trials with maize were carried out upon 6 private farms in the northwestern and central-western districts. Detailed notes are given for each experiment in regard to seasonal and soil conditions and cultural operations. Yields reaching 60 bushels and above were secured.—*L. R. Waldron.*

3185. RICHARDSON, A. E. V. **Development of grass lands.** Jour. Dept. Agric. Victoria 22: 193-207. 4 fig. 257-270. Map. 1924.—This is a general discussion of the problem of pasture production—the natural advantages of native plants for grazing, importance of pastures, deterioration of grasslands and their improvement. Of the 48,000,000 acres of crop and grassland in the United Kingdom, 28,000,000 acres are under permanent pasture grasses. Australia has 4,000,000 acres of artificially sown grassland. In Australia barley grass (*Hordeum murinum*), soft brome (*Bromus mollis*), barren fescue (*Festuca bromoides*), thistles and other noxious weeds come in, following overstocking. The deficiency of natural phosphates in the soils should be made up in the application of top-dressings. The results of experiments are given, showing the value of superphosphates and lime in (1) increasing the bulk of herbage, (2) increase in amount of clovers and trefoil, (3) in raising the carrying capacity, and (4) in improvement of palatability. In the drier and hotter sections of Australia the native grasses "should be made to furnish the bulk" of the pasture, while in the moister areas introduced grasses and clovers "should be freely used."—*Wm. E. Lawrence.*

3186. RUSSELL, E. J. **Science and crop production.** Scottish Jour. Agric. 5: 117-126. 1922.—Fertilizers and cultural problems.—*H. V. Harlan.*

3187. SALAMAN, R. N., Chairman. **Report of the Potato Synonym Committee.** Jour. Nat. Inst. Agric. Bot. 1924²: 29-38. 1924.—A list of about 29 varieties of potatoes is given and under each one are listed other varieties which can not be distinguished from it and are therefore regarded as synonymous. Lists of varieties susceptible to and free from wart disease are given.—*H. L. Westover.*

3188. SALAMAN, REDCLIFFE N., Chairman. **Synonyms of varieties of potatoes.** Jour. Nat. Inst. Agric. Bot. 1924²: 39-53. 1924.—A list of the distinct varieties of potatoes tested at the potato testing station at Ormskirk, 1915-1924, for immunity from wart disease; also an alphabetical list of synonymous varieties.—*H. L. Westover.*

3189. SALOMONE, G., AND OTHERS. **Disertaciones sobre Misiones, Chaco, Formosa, Chubut y otras regiones de la Patagonia por la conferencia de agronomos.** [Discourses about Misiones, Chaco, Formosa, Chubut and other regions of Patagonia by the congress of Agronomists.] 608 p. Illus. Buenos Aires, 1920.—A conference to study the various problems of these regions of Patagonia, particularly as they relate to agriculture. Certain members of the commission discuss some of the problems in detail, after which rather complete individual discourses are given by various members of the congress on soil, climate, topography, settlement, schools, government, native vegetation and agriculture of these provinces.—*H. L. Westover.*

3190. SANZ, BALBINO D., D. ALBERTO WIEDMAIER, BERNARDO WUNDER, HUGO MEDINA, AND C. E. KEMPSKI. **Memoria de los trabajos realizados en el año 1924.** [Report of the work accomplished in the year 1924.] 314 p. 67 fig. Inst. Biol. y Estacion Exp. Soc. Nacion. Agric.: Santiago, Chile, 1925.—This is a report of the work on this new experiment station which was established in 1923 through the efforts of the "Sociedad Nacional de Agricultura" Some of the features discussed are: Buildings and equipment; work of the Biological Institute with special reference to diseases of livestock and poultry; the experiment station Director's (Alberto J. Wiedmaier) trip to Europe and the U. S. A. and his observations on the experimental work in those countries; poultry investigations with special reference to incuba-

tion and feeding; plans for dairy work and utilization of silage in connection with the dairy; preliminary tests and plans for future tests with a great number of native and introduced varieties of the various cereal and forage crops including wheat, oats, barley, flax, alfalfa, soybeans, sorghos, beans, peas, clovers, and root crops.—*J. L. Westover.*

3191. SAUNDERS, C. B. **Official Seed Testing Station for England and Wales. Sixth Annual Report.** Jour. Nat. Inst. Agric. Bot. 1924: 20-28. 1924.—A report on the number of samples of the various kinds of seed tested, with data on the average germination as compared with that of previous years. In the case of clovers, the average percentage of impurities, the germination of hard seed, and percentage of samples containing dodder are given.—*H. L. Westover.*

3192. SHIRLOW, N. S. **Field experiments with wheat. Cowra experiment farm. Variety trials over a three-year period.** Agric. Gaz. New South Wales 36: 761-764. 1925.—Of the early sown varieties seeded at 42 pounds per acre, Bena yielded highest at 47 bushels per acre as an average for 3 years. Waratah gave the highest maximum yield of 44 bushels in the late sown trials. In addition to Waratah and Bena the variety, Wandilla, is favorably mentioned. Hard Federation was used as the check variety.—*L. R. Waldron.*

3193. SIMON, OTTO TH. **Die Einsäuerung grüner Pflanzen.** [Ensiling green plants.] Mitteil. Deutsch. Landw. Ges. 40: 834-839. 1925.—A brief review of different methods of ensiling, together with the personal experience of the writer. Good success was had with a mixture of vetch, peas, beans and oats and with sunflowers.—*A. J. Pieters.*

3194. SKINNER, J. J., B. E. BROWN, AND F. R. REID. **The effect of borax on the growth and yield of crops.** U. S. Dept. Agric. Dept. Bull. 1126. 1-29. 9 pl. 1923.—Results presented show that borax proved harmful to plant growth. Varying quantities of borax, ranging from 1 to 400 pounds per acre, were mixed with fertilizer and applied to the soil in 3 different ways. The results show that the potato can tolerate a greater quantity of borax than plants like corn or beans. The degree of injury, however, was modified considerably according to rainfall. The way in which the fertilizer was applied exerted considerable influence, and in practically every case the fertilizer-borax mixtures drilled in the furrow, followed by immediate planting, produced much worse injury and with lower concentrations than where the fertilizer-borax mixtures were applied some time before planting or by broadcasting and planting immediately. The effect of borax on the germination and yield of Lima beans at Arlington, Virginia, was most noticed where the fertilizer-borax mixtures were applied in the furrow and planting was done at once. Less than 50% germinated with an application of 10 pounds of borax per acre, and with even less quantities the effect was marked. The effect of borax on snap beans at Arlington, was quite marked, injury being noticeable with 5 pounds of borax per acre. Corn displayed a marked reaction to borax. In the case of immediate planting, where the fertilizer was drilled in the furrow, only 2 or 3 pounds of borax were required to produce lighter colored plants. Four pounds of borax in the drill depressed the yield of both stover and corn. When sown broadcast, 20 pounds were required to depress the yield. The effect of borax on cotton in experiments conducted at Arlington, Virginia, and of Muscle Shoals, Alabama, was to severely injure the plants with 20 pounds of borax per acre and to slightly injure the plants with 10 pounds per acre. With high rainfall the degree of injury was slight; with low rainfall, more severe. While there was evidence of borax remaining in the soil for a period of some months even with considerable rainfall, the injury was practically confined to the drill rows with high initial application of borax.—*J. J. Skinner.*

3195. SMITH, J. M. **Lucerne versus temporary pasture.** New Zealand Jour. Agric. 30: 296-301. 4 fig. 1925—Lucerne pasture was found to maintain its production much better than the temporary pastures, but the greater grazing capacity of the temporary pastures warrants their use.—*N. J. Giddings.*

3196. SMITH, TEMPLE A. J. **The tobacco industry. Lessons from America.** Jour. Dept. Agric. Victoria 22: 165-169, 238-241, 287-290. 1924.—This is a report on a visit by the author to the U. S. A. to inquire into the most successful methods of tobacco growing. Superphosphate in applications up to 5 hundred-weight was found to affect the quality and quantity of tobacco leaf. It hastens the ripening of the crop by 4 weeks, the color is lighter and brighter, and texture smoother and softer. The best tobaccos are produced on poor, light, sandy soils

with heavy applications of fertilizer. Blue mold is the chief disease Victorian growers will have to contend with, as other diseases common in America are almost entirely absent in Australia. The author recommends the growing of tobacco in Australia 40 miles or more from the coast. In Victoria there are 400,000 to 500,000 acres of land capable of producing good leaf tobacco.—*Wm. E. Lawrence.*

3197. SMITH, WILLIAM G. *Common weeds.* Scottish Jour. Agric. 5: 39-49. 1922.—Description and control.—*H. V. Harlan.*

3198. SNELL, KARL. *Kartoffelsorten.* [Potato varieties.] Ed. 3. Arbeit. Forschungsinst. Kartoffelbau 5. 1-138. Pl. 1-2 (colored), fig. 1-15. 1925.—In the 1st part are discussed the characteristics of the tuber and plant which form the basis of classification. The most important tuber characteristics employed for this purpose are shape, color of skin and flesh, character of eyes and sprouts, and cooking quality; those of the plant include character of the stem, leaves, flowers, fruit, and time of maturity.—The 2nd part is devoted chiefly to the author's classification of German varieties, together with an analytical key to the same, and descriptions of 305 varieties which include the leading varieties of Germany, Holland and Great Britain, and of the 12 groups of American varieties. Classification is based on the conception of types represented by well known varieties around each of which are grouped a number of varieties of similar characteristics, forming the 16 groups of plant types and the 11 groups of tuber types.—*C. F. Clark.*

3199. SOUTHWORTH, WM. *Preliminary studies in forage crop improvement.* Sci. Agric. 5: 301-305. 2 Fig. 1925.—In a test of 27 legumes and grasses running since 1915 at the Manitoba Agricultural College, alfalfa has been found the most productive and selections for hardiness and seed production are being made of the Grimm variety and sand lucerne.—*L. W. Kephart.*

3200. SPLECHTNER, F. *Über die Variabilität einiger Populationen und vegetativer Linien von Agrostis stolonifera L.* [Variation in certain populations and vegetative strains of *A. stolonifera* L.] Zeitschr. Pflanzenzucht. 10: 69-127. 12 fig. 1925.—The morphology and anatomy of the various parts and organs of the plant in the genus *Agrostis* are discussed in considerable detail. Measurements are given indicative of the variations in the anatomy of organs of plants in populations growing under varying conditions. These observations were made on populations of mixed *Agrostis* species occurring in the seed-producing areas of southern Germany. The difficulty of classifying the species on the basis of morphological and anatomical characteristics is discussed, also the marked tendency to the formation of numerous intermediate types arising out of the extreme morphological and anatomical fluctuations. The genus is broadly divided into the upright and procumbent types. Plants of the former type lend themselves to abundant seed production true to type, whereas in the latter type (in which is included *A. stolonifera*) the tendency seems to be to self-sterility and cross-fertilization.—*W. B. Lydenberg.*

3201. STANDLEY, PAUL C. *A new United States weed: Hymenophyza pubescens.* Science 62: 509-510. 1925.—A few colonies of this perennial crucifer have appeared at Pocatello, Idaho. It is a native of the Altai region of central Asia and is a potential pest for the western U. S. A.—*C. J. Lyon.*

3202. STAPLEDON, R. G. *Nomenclature of grasses and clovers.* Jour. Ministry Agric. Great Britain 31: 156-161. 1924.—The author calls attention to the confusion in the use of terms defining certain forage crops and suggests a more exact use of such terms as "nationality" "strains," "stock seed," "wild," or "indigenous seed," specially as applied to white clover, harvest year, broad red clover, early-flowering and later flowering red clover and cowgrass.—*A. J. Pieters.*

3203. STAPLEDON, R. G., AND RHODA JONES. *Lucerne.* Jour. Ministry Agric. Great Britain 31: 41-50. 1924.—This article is devoted largely to a discussion of experiences in growing alfalfa in various countries where it is an important crop. It treats especially of the date, rate and methods of seeding; of after management, including cultivation and time of cutting; of various mixtures with other grasses and clovers; and of possibilities of improvement by breeding.—*H. L. Westover.*

3204. STEWART, GEORGE. *Field beans.* Utah Agric. Exp. Sta. Circ. 37. 1-45. 15 fig.

1919.—The bean plant and methods of production under irrigation are described. Urgency of weed control in the seed bed before planting is emphasized. Original experimental yield data of varieties show Tepary to lead, with Little Navy Wonder, Utah Pea, White Marrow, and Michigan Pea to be practically tied for 2nd place. How to avoid waste during irrigation and harvesting, how to select seed, how to grade the beans for market, how to utilize the by-products, and how to grow the crop on the dry-farm are all considered.—*B. L. Richards.*

3205. STEWART, GEORGE. **Potato production.** Utah Agric. Exp. Sta. Circ. 40. 1-54. 20 fig. 1919.—A discussion of production under irrigation is re-inforced throughout with concrete experimental evidence. The following are considered in detail: Place in the cropping system, manuring, choice of seed, size of set, disease control, cultivation, irrigation, storage, and marketing. Original data show improvement in yield of 22.7-77.8% by hill selection. Two tables prove conclusively that 1- to 2-ounce sets are the best size for planting.—*B. L. Richards.*

3206. TAYLOR, J. W. **Experiments with small grains on the Arlington Experiment Farm.** U. S. Dept. Agric. Dept. Bull. 1309. 1-27. Pl. 1-4. fig. 1-10. 1925.—These experiments comprise the results of studies on varietal adaptation and rates of seeding of the principal fall-sown cereals during a 14-year period, 1910-1923.—*Author.*

3207. THOMAS, I. **Wheat experiments at the Chapman Experiment Farm.** Jour. Dept. Agric. Western Australia 2nd ser. 2: 293-297. 1925.—(1) It was found that plowing to a depth of 8 inches gave better results than either 4 or 6 inches, although the difference was not great. The tables give the results for a period of 11 years.—(2) In a comparison of 14 varieties of wheat, tables give the results for 1923 and 1924 as to yield of both hay and grain. The varieties, Merredin, Gresley, Nabawa, and Toby's Tusk rank high as regards grain yield during both years.—(3) Four varieties, representing late maturity, mid-season maturity, early and very early maturity, were tested as to time of planting. Using grain yields as a criterion, the latest, or June planting gave the best results with all varieties except the very early, where the medium planting date was superior. Results are given in both graphic and tabular form.—*P. J. Olson.*

3208. THOMAS, I., AND F. L. SHIER. **Trials with imported varieties of lupins.** Jour. Dept. Agric. Western Australia 2nd ser. 2: 248-250. 1925.—This is a continuation of a previous report on 49 varieties imported from Germany and grown at Merredin and Chapman Experiment Farms for comparison with the local varieties. A tabular statement is presented in which the varieties are grouped and described as to germination of seed, and appearance and habit of plants.—*P. J. Olson.*

3209. UPHOF, J. C. TH. **Le "dry-farming" dans les régions sémi-tropicales des États-Unis.** [Dry-farming in semi-tropical regions of the United States.] Rev. Bot. Appl. et Agric. Coloniale 4: 433-442. 1924.—A description is given of the conditions of soil, temperature and rainfall in Arizona, New Mexico and California in relation to crop production under dry-farming conditions. The harmful effects of the black and white alkali in relation to crop production are demonstrated. Cultural directions are given for wheat, sorghum, and tepary beans (*Phaseolus acutifolius*). Papago sweet corn and Hopi maize are recommended for breeding purposes in obtaining drought-resistant strains. Spineless prickly pears are discussed as food for cattle during drought.—*Author.*

3210. UPHOF, J. C. TH. **La culture des Opuntias sans épines.** [Growing spineless Opuntias.] Rev. Bot. Appl. et Agric. Coloniale 5: 765-768. 1925.—A number of species and varieties of spineless Opuntias are used as feed for cattle. Their source is unknown but presumably they originated by mutation. One of the best hardy species is *O. castillae* or Nopal de Castilla which reaches a height of 1.8 to 3 and sometimes 4 m. *O. ellisiana*, which grows much slower, is very cold-resistant. All species and varieties are easily propagated from cuttings that are placed at a distance of 0.9-1 m. in rows 1.8-2.4 m. apart. Killing temperatures for the following varieties are indicated: *O. castillae* ($-17^{\circ}\text{C}.$), *O. fuscicaulis* (-10°), Burbank Special (-8°), *O. ficus indica* from Malta (-6°), *O. ellisiana* (-18°), and *O. ficus indica* from Sicily (-8°).—*Author.*

3211. UPHOF, J. C. TH. **Mais in de zuidelijke staten van Noord-Amerika.** [Corn in the Southern States of North America.] Indische Culturen 1: 550-564, 1925.—An extensive de-

scription is given of corn growing in the Southern States (U. S. A.) as compared to the Dutch East Indies.—*Author*.

3212. VALEIX, J. **Fertilisation des semences.** [Fertilizing seed.] *Prog. Agric. et Vitic.* 75: 280-281. 1920.—Soaking seed of potato, barley, oats, beets and vegetables in 2% ammonium nitrate has apparently given increased yields. The treatment with a copper salt may be combined with the above in a single operation.—*E. L. Proebsting*.

3213. VIEULES, A. **Culture de la betterave sucrière dans le Sud-Oest.** [Sugar beet culture in the Southwest.] *Prog. Agric. et Vitic.* 75: 16-20. 1920.—An account of the history of the sugar beet industry in southwestern France, and of the recent attempt to develop this industry there.—*E. L. Proebsting*.

3214. WAHLEN, F. T. **Seed testing for the international trade with Canada.** *Seed World* 17³: 14-15. 1924.—The Canadian Seed Importation Regulations have been amended so as to permit of prompt release of a shipment by customs officers when the seed is accompanied by a certificate issued by a certified seed testing laboratory. Detailed regulations and a list of certified seed laboratories are given.—*A. J. Pieters*.

3215. WAHLEN, F. T. **The determination of the origin of agricultural seeds with special reference to red clover.** *Sci. Agric.* 5: 369-374. 1925.—Knowledge of the country of origin of seed is becoming of great importance in determining their agricultural value. With reservations, the author concludes that the safest guide to the origin of seed, particularly red clover and alfalfa, is the weed seed content of a sample. Lists are given of the characteristic weed species likely to be represented in seed from southern Europe, Italy, eastern Europe, western Europe, central Europe, Chile, North America and eastern Canada. The color of seed is variable but may sometimes be used to distinguish French red clover seed from Italian. The weight per 1000 kernels also varies but in general is in the ascending order of French, Italian, Canadian, British and Chilean. Particles of soil in the seed may also be characteristic, as are certain vegetable and animal impurities and the residues from seed cleaning.—*L. W. Kephart*.

3216. WARE, W. M. **White Clover.** Ministry of Agric. and Fisheries (Great Britain). *Miscel. Publ.* 46: 1-26. 1925.—The scope of this publication (from the Southeastern Agricultural College, Wye, Kent) is indicated by the chapter headings, comprising: Introduction, history, use in agriculture, cultivation for seed, the seed and strains. Throughout the publication reference is made particularly to the so-called "wild white clover," the recently popularized form of white clover in Great Britain. In the concluding chapter, New Zealand white clover, mammoth or Ladino white clover and the Stryno and Morso strains of Dutch white clover are also discussed.—*L. W. Kephart*.

3217. WATSON, J. A. SCOTT. **The choice of varieties and stocks of crop plants.** *Trans. Highland and Agric. Soc. Scotland* 37: 55-70. 1925.—The degeneration of potato varieties is largely the accumulation of diseases. Cereal varieties are known to change very little. Cross-fertilized varieties adapt themselves to a degree. Disease resistance is an important feature in choice of varieties. Strength of straw and earliness as well as quality are important in cereals. Adequate tests are necessary to make intelligent selection of varieties.—*H. V. Harlan*.

3218. WENHOLZ, H. **Hickory king maize contest.** *Season 1924-25.* *Agric. Gaz. New South Wales* 36: 783-784. 1925.—This contest was carried out on 3 farms, with 8 men competing. The maximum yield reported was 88 bushels per acre.—*L. R. Waldron*.

3219. WENHOLZ, H. **The storage of maize.** Its possibilities in New South Wales. *Agric. Gaz. New South Wales* 36: 799-802. 1925.—The advantages and disadvantages of storage of shelled corn are discussed.—*L. R. Waldron*.

3220. WESTOVER, H. L. **Red clover seed production in Chile.** *Seed World* 17³: 7-8. 1924.—A discussion of production methods, areas utilized and yields.—*M. T. Munn*.

3221. WHITE, C. T. **Weeds of Queensland.** No. 39. *Queensland Agric. Jour.* 23: 417-418. *Pl.* 70. 1925.—The article contains a description and a brief account of the distribution and properties of *Salvia lanceifolia* Poir.—*W. D. Francis*.

3222. WHITE, C. T. **Weeds of Queensland.** No. 40. *Queensland Agric. Jour.* 23: 520-521. *Pl.* 89. 1925.—The botanical characters, distribution, properties and means of eradication of *Verbesina encelioides* are outlined.—*W. D. Francis*.

3223. WHITE, THOS. H. **Fertilizing potatoes in Maryland.** *Potato News Bull.* 2: 477-479. 1925.

3224. WIENER, W. T., AND R. BROADFOOT. **The amount of variability which may be expected to occur in a determination of comparative yields in small grain.** *Sci. Agric.* 5: 305-309. 1925.—The yields of 94 $\frac{1}{10}$ -th-acre plots of Mindum wheat were compared when taken singly and when grouped to form plots of $\frac{1}{5}$ -th-, $\frac{1}{2}$ -th- and $\frac{1}{10}$ -th-acre each. The conclusion is reached that $\frac{1}{10}$ -th-acre plots replicated 3 or 4 times give a higher degree of precision than larger plots with fewer replications.—*L. W. Kephart.*

3225. WIENER, W. T., AND R. BROADFOOT. **The effect of fallow borders on the variability of plot yields.** *Sci. Agric.* 5: 310-312. 1925.—The outside drill rows in plots of Mindum wheat, each 8 × 72.6 feet, yielded 26.52% more than the 12 central rows, but the effect of the fallow borders did not extend inward beyond the outside rows.—*L. W. Kephart.*

3226. WILLIAMS, W. L. **The beet sugar industry.** *Jour. Dept. Agric. Victoria* 22: 321-325. 1924.—The southern states of Australia are said to be well suited to beet sugar production under irrigation conditions. Since 1910 the beet sugar industry has been growing steadily.—*Wm. E. Lawrence.*

3227. WILSON, HUGH I. **Controlling crab grass.** *Bull. Green Sect. U. S. Golf Assoc.* 5: 91. 1925.—Persistent use of a chain harrow or a special sweeper to raise the crab grass stems so that they could be cut off with a mower has resulted in virtual elimination of this weed from the courses of the Merion Cricket Club, Haverford, Pennsylvania. Badly infested areas were also reseeded and top-dressed in spring and fall.—*L. W. Kephart.*

3228. WORKING, EARL B. **Physical and chemical factors in the growth of asparagus.** *Arizona Agric. Exp. Sta. Tech. Bull.* 5: 87-124. *Fig. 14.* 1924.—Following a description of methods, the results of the author's experiments to determine the effect of light on growth, are given in detail, particularly as it effects branching, root growth, rate of growth and acidity; the effect of temperature on growth, as it affects sprouting and germination, rate of growth, branching and hydration capacity; the effect on growth of the chemical environment of the soil as indicated by results obtained from various solution cultures, and the chemical effect on germination and sprouting; and the hydration capacity of asparagus tissues. The bulletin concludes with a rather complete bibliography.—*H. L. Westover.*

3229. ZIMMERLY, H. H. **Potash for truck crop potatoes in eastern Virginia.** *Potato News Bull.* 2: 475-477. 1925.—Excerpts from potato fertilizing studies reported in Virginia Truck Exp. Sta. Bull. 21 and unpublished studies are given to show that muriate is at least equal to sulphate as a source of potash, and that the application need not exceed 5%.—*F. Weiss.*

SOIL SCIENCE (EDAPHOLOGY)

3230. AYRES, W. E. **Report Delta Branch Experiment Station for 1922 and 1923.** *Mississippi Agric. Exp. Sta. Bull.* 221: 1-15. 1924.—With the use of 22½ pounds actual nitrogen to the acre the corn yield was increased 18.1% by ammonium sulphate, 16.8% by nitrate of soda, 18.1% by nitrate of soda and cottonseed meal, and 12.5% by cottonseed meal. The corn yield was increased 5.2% by the use of 50 pounds of nitrate of soda to the acre, 17.4% by 100 pounds, 30% by 150 pounds, 47.4% by 200 pounds, 68% by 250 pounds, and 72.4% by 300 pounds. Smut infected oat seed yielded 12% less than seed treated with the dry formalin process.—*J. F. O'Kelly.*

3231. BEESON, M. A., AND H. F. MURPHY. **The effect of lime and organic matter on the so-called hardpan subsoils.** *Oklahoma Agric. Exp. Sta. Bull.* 143: 1-7. 1922.—Experiments were made at the experiment station at Stillwater, Oklahoma, on a soil having a tough impervious clay hardpan to determine the effects of lime and organic matter on the water holding capacity of the soil and on the resistance of the subsoil to penetration by the roots of alfalfa. The results show that organic matter increased the water-holding capacity but manure lessened penetration in the 1st foot. Lime improved the water-holding capacity in both the 1st and 2nd foot sections. Lime increased the yield of alfalfa but manure gave still greater increases. The greatest depth of root penetration and the largest root development were found where both lime and manure were applied. The tap roots in that case extended below the hardpan subsoil into the more porous lower subsoil.—*T. D. Rice.*

3232. BÉLIME, E. *Les irrigations du Niger, discussions et controverses; introduction par le général Hélo.* [Irrigation on the Niger.] *v + 116 p. Map.* Comité du Niger: [Paris], [1923?].—This publication consists of 3 series of discussions and controversies on the problems arising in the irrigation of lands along the Niger River. The 1st and 3rd parts consist of articles, respectively by AGUSTE CHEVALIER and FERNAND BERNARD in which they take a pessimistic view of the feasibility of developing the irrigable lands along the Niger, and replies are made to each article by Bélime. The 2nd part contains an unfavorable opinion by YVES HENRY, Inspector General of Agriculture for French West Africa, on the possibility of the economic production of cotton on these lands, with a reply by Bélime.—*T. D. Rice.*

3233. BOUYOUCOS, GEORGE J. *Rate and extent of solubility of minerals and rocks under different treatments and conditions.* Michigan Agric. Exp. Sta. Tech. Bull. 50. 1-32. 1921.—An extensive study of the rate of solubility of a large number of rocks (22) and 20 minerals when freshly powdered and after leaching, at room temperature, at 53° and under steam pressure (about 117°C.), these determinations being made with small as well as with comparatively large amounts of water. Determinations were made by the freezing-point depression method. When first powdered most of these substances showed considerable readily soluble material. After this was leached out the additional solubility even over a period of 100 days was very small. The solubility was mostly greater at the higher temperatures. At the room temperature the solubility was greater with small amounts of water than with large amounts. At 53° the difference was but slight. All the rocks and minerals gave solutions alkaline in reaction. Further experiments were reported in which the powdered substances were treated with single salts as N/10 solutions for 24 hours and then washed until free from soluble salts and then tested for solubility. With some salts this was increased while with others no difference was noted. As a rule rocks and other minerals had their solubility changed but little by treatment with salts.—*Ernst A. Bessey.*

3234. BROWN, B. E. *Field studies with new nitrogen salts.* Potato News Bull. 2: 491-494. 1925.—This is a preliminary report of experiments conducted in Maine, Long Island, and Virginia with certain new atmospheric nitrogen fertilizers, such as ammonium nitrate, chloride, and phosphate, and urea compounds. In respect to yield their performance has equaled or bettered that of sodium nitrate and ammonium sulphate, but much remains to be found out regarding suitable mixtures and manner of applying.—*F. Weiss.*

3235. CARLSON, F. A. *Some relations of organic matter in soils.* New York [Cornell] Agric. Exp. Sta. Mem. 61. 3-24. 1922.—This paper reports a study of the effects of certain treatments on the organic C and N in a Dunkirk clay loam, including manure, potassium sulphate and lime on plots of permanent grass or with a crop rotation. Rotations with and without legumes were studied. The experiments were conducted through periods of 8 and 10 years. In general, limed plots contained more organic C and N than unlimed plots. Without legumes in the rotation there was a decrease in organic C and N in the soil. Plots in permanent grass showed an increase in C and N. Plots with legumes in rotation showed a marked increase in N and the increase was greater in the limed plots than in unlimed plots. Limed plots showed higher yields than unlimed plots. Crops in rotation with legumes removed more N from the soil than did crops in rotation without legumes. There is a close relation between organic C and N and possibly a relation of these to yield.—*Lewis Knudson.*

3236. CHAPMAN PAUL W., CLAUDE WILBUR EDGERTON, J. G. LEE, JR., L. M. SHEFFER, AND ROY H. THOMAS. *Farm crops.* viii + 550 p. *Illus.* Turner E. Smith Co.: Atlanta. 1925.—This book has been prepared primarily for use as a text in the vocational agricultural classes of the secondary schools of the Southern States. The usual text book treatment has been given to every common crop grown in the region, with respect to all the operations of production and marketing. In addition, the managerial aspect of the farm business is strongly emphasized throughout and every crop is treated in relation to the other crops grown on the farm.—*T. D. Rice.*

3237. CHAVAN, P. *A propos de la cyanamide.* Prog. Agric. et Vitic. 75: 58-61. 1920.—The author finds calcium cyanamide to be non-toxic to plants when applied in dilute solution instead of dry. He finds the loss of nitrogen from this compound due to mixing with other fertilizers to be negligible.—*E. L. Proebsting.*

3238. DOWN, E. E. **Tests with sugar beets.** Michigan Agric. Exp. Sta. Circ. 66. 1-8. Fig. 1. 1925.—This is a brief popular report on 3 years' work with sugar beet seed from 29 different sources. The following data are given: Average yield, sugar percentage and total sugar recoverable.—*Ernst A. Bessey.*

3239. EMERSON, PAUL. **Soil characteristics, a field and laboratory guide.** $x + 222$ p. 5 fig., fold. map. McGraw-Hill Book Co.: New York, 1925.—This manual is intended to serve as a guide for the student, instructor and investigator. The 4 parts into which the book is divided cover the more important fields of soil research and include specific directions for investigation of the properties of soils according to methods selected by the author. The 1st part is a brief review of the methods employed in field examination of soils and a comparison of several systems of soil classification. The 2nd part contains directions for a number of laboratory experiments for determination of the physical properties of the soil. The 3rd part deals with methods of chemical analysis. The 4th section describes laboratory methods for examination of the microorganisms of the soil.—*T. D. Rice.*

3240. GILE, P. L., AND J. G. SMITH. **Colloidal silica and the efficiency of phosphates.** Jour. Agric. Res. 31: 247-260. Pl. 1. 1925.—Evidence is given that the efficiency of phosphatic fertilizers is markedly influenced by the character of the soil and it is suggested that the colloidal material of the soil is responsible for this influence. The effect of a simple colloidal material—an artificial silica gel—on the growth of millet in sand culture was determined. The addition of silica gel markedly increased the growth of plants supplied with rock phosphate, and only slightly benefited plants supplied with the soluble acid phosphate. Growth of the plants was approximately proportional to the quantities of phosphoric acid assimilated but bore no relation to the quantities of silica taken up. It is held that silica gel increased the efficiency of rock phosphate by increasing the quantity of phosphoric acid in solution. This conclusion is substantiated by experiments showing that the solubility of rock phosphate in a nutrient solution was increased by the addition of silica gel. Criticism is made of the idea that increased growth of plants observed in similar experiments is due to an increased assimilation of silica which enables the plant to get along with less phosphoric acid. Artificial gels are compared with the colloidal soil material and their influence on phosphates is discussed.—*P. L. Gile.*

3241. GREAVES, J. E., AND E. O. GREAVES. **Bacteria in relation to soil fertility.** xviii + 239 p. illus. Van Nostrand: New York, 1925.—This book describes in non-technical language the various kinds of microorganisms with special reference to the classes of bacteria which affect human existence favorably or adversely. The factors which favor the existence and growth of bacteria and the methods employed in their culture in the laboratory are discussed. Especial attention is given to the bacteria of the soil and their relation to agriculture.—*T. D. Rice.*

3242. HOAGLAND, D. R. **Physiological aspects of soil solution investigations.** Hilgardia 1: 227-257. 1925.—A soil solution is, in large measure, a biologically controlled system, nearly all the anion (NO_3 , SO_4 , HCO_3) content being of biological origin. Equivalent quantities of cations must enter into solution along with the anions. Two assumptions are made: (1) Plants absorb inorganic elements only from the soil solution; (2) absorption is primarily concerned with ions. It has been suggested that a decrease in concentration of essential elements may be a necessary condition for optimum yield of crops. A knowledge of the composition of a soil solution or of an artificial culture solution does not, in itself, enable us to predict the rate at which each component ion will be absorbed or utilized by the plant. Agricultural plants can make equally good growth in a very great variety of culture solutions. The whole problem of absorption would be simplified if it were possible to explain the relations of the plant to the soil on the basis of chemical equilibria and mass action effects, but unfortunately biological systems do not fit completely into such a scheme. The fact that plants grow well in soils showing a distinctly alkaline reaction in their suspensions, does not, in itself, prove that the plants make their best growth in alkaline solutions. Many soils of an acid intensity of pH 5-6 are improved by liming, but various other changes occur when lime is added, besides the lowering of the H-ion concentration. No simple application of an isoelectric point theory can be made, so far as ion absorption is concerned. In soils, a very high

pH value is almost certain evidence that the soil solution has a deficiency in supplying power for one or more ions. The difficulty in maintaining pH values in sand cultures is noted. We need to know the quantity of lime required to bring the soil solution to a physiologically suitable composition for a given crop, not merely with regard to H-ion concentration but also with reference to the concentration of essential ions, to toxic substances, and to biological activities.—*A. R. C. Haas.*

3243. KEEN, B. A. Chemical problems of soil fertility. [Rev. of: FARADAY SOCIETY. *Base exchange in soils: A general discussion held by the Faraday Society, December 1924. P. 547-617.* The Faraday Society: London, 1925.] *Nature* 116: 638. 1925.

3244. McCALL, M. A. The soil mulch in the absorption and retention of moisture. *Jour. Agric. Res.* 30: 819-831. *Fig. 1-6.* 1925.—Ordinarily it is difficult to distinguish between the effect of the soil mulch on moisture absorption and its effect on moisture retention. This study (Washington Agric. Exp. Sta.) was made under climatic conditions favorable for measuring each effect. The conclusions follow: (1) The soil mulch inhibits moisture absorption, under conditions where individual rains are not of sufficient volume fully to penetrate the mulch. (2) The mulch inhibits absorption by increasing current evaporation in the newly fallen moisture. The volume weight of the mulch is less than that of an equal depth of unstirred soil and, as a result, the moisture content of the mulch immediately after a rain is higher on a percentage basis than that of the unstirred soil. When conditions favor evaporation, the result is a greater total moisture loss from the mulch. The final moisture content is due to a cumulative effect following several rains. (3) The soil mulch prevents the loss of moisture already in the soil. (4) The practical use of the soil mulch depends on climatic conditions which influence the prominence of the inhibitory effect on absorption or the positive effect on retention, or which may nullify either or both.—*Author.*

3245. McCool, M. M., G. M. GRANTHAM, AND P. M. HARMER. Standard fertilizers for Michigan. *Michigan Agric. Exp. Sta. Circ.* 53. 1-4. 1923.

3246. McCool, M. M., C. E. MILLER, AND G. M. GRANTHAM. Soil fertility. *Michigan Agric. Exp. Sta. Bull.* 290. 1-39. *Fig. 1-14.* 1920.—A discussion of the need of restoring soil fertility on different types of soil and of methods of attaining this object, with examples.—*Ernst A. Bessey.*

3247. MAUME, L. Essais culturaux sur la valeur fertilisante de la dolomagnésie. [Field tests on the value of dolomite as a fertilizer.] *Prog. Agric. et Vitic.* 75: 179-183. 1920.—Applications of dolomite seemed to increase the yield of potato and cabbage, but to decrease the yield of onions.—*E. L. Proebsting.*

3248. NAGANT, H. M. Calcaires magnesiens versus calcaires purs comme amendement des sols. [Magnesium lime versus calcium lime as a soil amendment.] *Sci. Agric.* 5: 379-382. 1925.—Experiments in the U. S. A. and Canada are quoted to support the belief that Mg in agricultural lime is not as toxic as was formerly supposed.—*L. W. Kephart.*

3249. NÉMEC, ANTOIN, ET MIHOVIL GRAČANIN. Influence de la réaction du sol sur l'absorption du phosphore et du potassium en présence de divers engrais phosphatés. [Influence of soil reaction on absorption of phosphorus and potassium in the presence of different phosphatic fertilizers.] *Compt. Rend. Acad. Sci. Paris* 181: 194. 1925.—The authors have measured the absorption by plants of phosphoric acid from various fertilizers and in different conditions of soil reaction. Rye plants absorb more phosphoric acid from an acid soil than from a neutral soil. The mineral phosphate of Constantine, insoluble in water, gave a higher absorption in proportion as the soil was more acid. Results of a similar kind have been obtained with half decomposed phosphate (neutral phosphate and phosphate of Reitmeir) and with Italian tetrphosphate. From investigations it is shown that the roots of rye plants excrete phosphates into the soil probably as buffer material into acid soils for the purpose of decreasing the unfavorable acidity of the root zone. From acid soils plants absorb a greater quantity of K than from soils with a weak alkaline reaction.—*Author (translated).*

3250. NOLTE, O. Betrachtungen über Theorie und Praxis der Düngung. [Theory and practice of manuring.] *Mitteil. Deutsch. Landw. Ges.* 40: 938-940. 1925.—Remarks on the economics of the use of artificial fertilizers, especially phosphates.—*A. J. Pieters.*

3251. NOER, O. J. The use of "activated sludge" as a fertilizer for golf courses. *Bull.*

Green Sect. U. S. Golf Assoc. 5: 203-205. 1925.—The dry, sterile material produced at the new Milwaukee sewage disposal plant has given excellent results as a grass stimulator on golf courses in a number of widely separated cities. It contains 6-7.5% nitrogen (as ammonia), 2-2.5% available phosphoric acid and less than 0.5% potash. It is suggested that the activated sludge be used in place of manure in making compost. A satisfactory rate of application is 100 pounds to 3000 square feet of green, although 3 times that quantity does not cause "burning" of the grass.—*L. W. Kephart.*

3252. PEROTTI, R., E F. AURELI. *Sul potere ammonizzante del terreno agrario.* [The ammonifying power of agricultural soils.] *Atti R. Accad. Lincei Roma* [Rendiconti Cl. Sci. Fis. Mat. e Nat.] 33¹: 405-408. 1924.—The method of nutritive solutions previously described for measuring the ammonifying power of agricultural soils was tried on various kinds of soils at different seasons of the year, and on the same soil in various states of cultivation. Considerable differences were found which were not always in conformity with the state of vegetation. The author concludes that in normal soils (those of alkaline reaction) the ability to produce ammoniacal nitrogen by microbiological means is generally sufficient for the needs of vegetation.—*F. M. Blodgett.*

3253. PEROTTI, R., E G. GRANDIS. *Sopra la misura del potere di nitrificazione del terreno agrario.* [A measure of the nitrifying power of agricultural soils.] *Atti R. Accad. Lincei Roma* [Rendiconti Cl. Sci. Fis. Mat. e Nat.] 33¹: 408-411. 1924.—The following conditions were found to be optimum in the solution method used in the determination of the nitrifying power of the soil: 50 cc. of 2% aqueous solutions of $(\text{NH}_4)_2\text{SO}_4$ and of bipotassium phosphate are poured into 100 cc. beakers in each of which has been weighed 1 gm. of MgCO_3 powder and with fragments of scoria placed in such quantity that they are not completely covered by the liquid. Each beaker is inoculated with 1 gm. of the soil to be examined and placed in a thermostat at 20°-25°C. for 25 days. For each examination, the average analysis of 4 cultures is taken. The nitrate is determined on the filtrate of the cultural liquid and on the washings of the scoria with the sulphophenic reagent.—*F. M. Blodgett.*

3254. PINCKNEY, REUBEN MARION. *Freezing point of soils at the moisture equivalent.* (Mimeographed.) 90 p. Edwards Bros.: Ann Arbor, Michigan, 1925.—The experimental work reported includes determinations of moisture equivalents and of freezing points of over 300 Minnesota soils. These soils were prepared both by the Bouyoucos method and by saturating the dry soils and centrifuging away the excess water. The freezing was performed both by the Bouyoucos method and by 2 modifications of it. The expansion on freezing of a small number of samples was measured by the Bouyoucos dilatometer method; the soil solution was displaced by alcohol and the freezing point determined. Lastly, dried and ignited soils were moistened with aqueous solutions and their moisture equivalents and freezing points were compared with those of the same material moistened with pure water.—*T. D. Rice.*

3255. SCHNEIDERWIND, WILHELM, UND F. MÜNTER. *Düngungsversuche aus den Jahren 1916-1922.* [Fertilizer experiments, 1916-1922.] *Arbeit. Deutsche Landw. Ges.* 324. 1-36. Berlin, 1923.—The results of a large number of fertilizer experiments in Germany (1916-1922) are reported, with special reference to the effects of nitrogen. Comparisons are made of results obtained with both spring and fall applications of fertilizers. Higher yields were obtained with NaNO_3 than with any other nitrogenous fertilizer on all crops except potatoes, where $(\text{NH}_4)_2\text{SO}_4$ was slightly superior. In general NH_4Cl was as effective as $(\text{NH}_4)_2\text{SO}_4$, except for potatoes. In the potash experiments, kainit gave larger yields of grain than the concentrated salts such as 40% potash salt and KCl but the concentrated salts, particularly KCl, were more effective for potatoes. The phosphate experiments indicated that Thomas meal and precipitated phosphate are more effective on light sandy soils deficient in Ca than are superphosphates.—*T. D. Rice.*

3256. SPURWAY, C. H. *Studies on active bases and excess acids in mineral soils.* Michigan Agric. Exp. Sta. Tech. Bull. 57. 1-27. Fig. 1-11. 1922.—The object of these investigations was to determine by means of the H-electrode and indirect titration the neutralizing value of mineral soils for acids and alkalis. These values were determined for 4 acid soils, a medium sand, a sand, a silt loam and a clay loam. The reagents used were $\text{Ca}(\text{OH})_2$, Al_2Cl_6

and HCl, added in N/10 equivalents so that all the curves might be plotted on the same scale. When soils are treated with $\text{Ca}(\text{OH})_2$ the reaction proceeds slowly and an equilibrium is reached on pH 7 with the quantity of $\text{Ca}(\text{OH})_2$ required to raise the pH of soils to this point in at least 24 hours; but in the presence of an excess of this reagent an equilibrium is not obtained, indicating a continued reaction over a longer period of time. There is also evidence of the formation of a series of salts in the alkali titration. A soil-acid equilibrium may be obtained in a short time in the presence of an excess of acid and the equilibrium is quite constant over a period of several days, showing that rather sharp distinction may be made between inactive and reactive soil bases. With the methods used no relationships were discovered between soil classes, active bases, excess acids and pH, but a direct relationship was shown between the base-acid ratio and the pH of soils. The base-acid ration in soils is believed to have an important practical application. The quantity of lime required to neutralize soils does not correlate with their pH value. Apparently it is still an open question whether soils should be neutralized, made alkaline, or held to a certain pH. There is need of a clearer understanding of the chemical reactions involved in the use of various fertilizing materials on different soils. Changing the solubility of soil bases and varying the pH of soils as well as the formation of new compounds undoubtedly exert a great influence on plant growth. If the degree of acidity of the soil correlates with crop response then the proportion of active soil bases to acids assumes great importance.—*T. D. Rice.*

3257. SPURWAY, C. H. Studies on the reactions between soils and various chemical compounds. Michigan Agric. Exp. Sta. Tech. Bull. 51. 1-29. 1921.—In most of the soils tested with K-salts a portion of the K was retained by the soil in exchange for Ca that appeared in the solution; $(\text{NH}_4)_2\text{SO}_4$ solution lost part of its NH_4 in exchange for Ca. Similarly, Ca was taken up in exchange for Mg, by soils containing the latter; and Mg in exchange for Ca, by soils containing the latter. All these reactions were reversible. The anions showed practically no fixation in the soil; K and Ca were fixed by soils from their hydroxides, but without exchange of cations. Tests were also made with potassium phosphate and dicalcium phosphate solution. Practically no Ca was fixed, but considerable K and PO_4 . Experiments were also made with acetates of K and Ca and with other salts.—*Ernst A. Bessey.*

3258. TACKE, BRUNO. Vergleichende Düngungsversuche auf Acker- und Weisenland ausgeführt in den Jahren 1903 bis 1918, von der Moor-Versuchs-Station in Bremen. [Comparative fertilizer experiments on cultivated and meadow land.] Arbeit. Deutsch. Landw. Ges. 319. 1-79. Berlin, 1922.—Comparisons are made of results obtained from experiments with (1) potash and phosphoric acid upon high moor, low moor, and sandy soils bordering the moor, (2) N in the form of $(\text{NH}_4)_2\text{SO}_4$ and NaNO_3 on high moor and sandy heather soils with and without the use of marl, (3) various forms of nitrogenous fertilizers on marsh soils, and (4) stable manure and commercial fertilizers on high moor soils. The greater part of the experiments with potash were not conclusive for the short periods carried out but it was shown that, in general, the peaty moor soils responded more favorably to the concentrated potash fertilizers than to weaker mixtures; and that applications of potash in the fall or winter are more effective than spring applications. On marsh soils rich in Ca, $(\text{NH}_4)_2\text{SO}_4$, cyanamid and guano, in the action of their N are almost equal to NaNO_3 , while sewage and flesh guano are decidedly inferior. The application of Ca in the form of highly calcareous marl produced a decrease in yields with CaNO_3 and guano but with NaNO_3 there was an increase, a result yet to be explained.—*T. D. Rice.*

3259. TSCHERMAK, [LEO]. [Rev. of: STINY, JOSEF. Leitfaden der Bodenkunde für ausübende Land- und Forstwirte, für Kulturtechniker und für Schüler land- und forstwirtschaftlichen Unterrichtsanstalten. (Guide to soil science.) viii + 203 p. 115 fig. Carl Gerolds Sohn: Wien und Leipzig, 1923.] Centralbl. Gesam. Forstw. 49: 312-314. 1923.

3260. WESTOVER, H. L. Effects of certain fertilizers on soil acidity, quality of turf and weed control. Bull. Green Sect. U. S. Golf Assoc. 5: 269-271. 1925.—Since 1921, plots of Rhode Island bent have been treated with various fertilizers. In November 1925 the pH values of the soil in the several plots were found to be: Check plot, 4.6; ammonium sulphate (alone and in mixture), 3.7-4.1; ammonium phosphate, 4.6; soybean meal, 4.6; cotton seed meal, 4.8; bone meal, 4.9; manure, 5.1; complete fertilizer, 5.8; sodium nitrate, 6.3; and ground

limestone, 6.8. Except for the ammonium sulphate plots the weed content of the turf, chiefly crab grass, increased with increase in the pH value. In plots with pH 4.0 or less, weeds constituted 12-25% of the growth; with pH 5.0-4.0, 40-60%; and with pH 7.0-5.0, 80-88%.—*L. W. Kephart*.

3261. WHEETING, L. C. Some physical and chemical properties of several soil profiles. Michigan Agric. Exp. Sta. Tech. Bull. 62. 1-31. Fig. 1-5. 1924.—The physical measurements, with the exception of the freezing point determinations, show the profiles of Miami loam, Miami silt loam, Bellefontaine loam, Bellefontaine sandy loam and Fox loam to be quite similar in constitution and afford proof of a general group of eluviation processes in the soil profiles of the several Michigan soils under investigation. Quantitative determination of the more common elements in the different horizons of all these profiles give evidence of a podsolization process resulting in a transfer and accumulation of material. In some cases there is evidence of both mechanical and chemical translocation.—*T. D. Rice*.

3262. WYATT, F. A. Factors affecting the productivity of western Canadian soils. Sci. Agric. 6: 69-88. 5 fig. 1925.—The varying productivity of the soils of the western Canadian plains is said to be due to the influence of different factors, chiefly lithological, weathering, distributing and climatic. The areas of production correspond most accurately to the lines of rainfall which radiate concentrically from the area of lowest rainfall in southeastern Alberta and southwestern Saskatchewan.—*L. W. Kephart*.

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

CARROLL W. DODGE, *Editor*

(See also in this issue Entries 3060, 3068, 3153, 3312, 3313, 3518, 3812, 3958)

3263. ANONYMOUS. Frans Kempe's minne. [The memorial to Frans Kempe.] Skogen 12: 331-334. 1 fig. 1925.—On the occasion of the unveiling of the bust of Dr. Frans Kempe at Domsjö, Lt., Carl Kempe read an appreciation of his father.—*Henry I. Baldwin*.

3264. ANONYMOUS. Oberforstmeister Prof. Dr. Alfred Möller. Centralbl. Gesam. Forstw. 49: 169-172. 1923.—Möller (Aug. 12, 1860-Nov. 4, 1922) specialized at first on mycology. After graduation from Eberswalde he spent 3 years in Brazil. In 1896 he became instructor and in 1899 professor of botany at Eberswalde, and from 1906 to 1921 was director of the Forest School. He was author of a large number of works on mycological and silvicultural subjects. In silviculture he specialized largely on *Pinus silvestris*. His best known works deal with the "Dauerwald" of von Kalitsch, at Bärenthoren.—*W. N. Sparhawk*.

3265. ANONYMOUS. Obituary. Eugene Tisserand. Nature 116: 791. 1925.—Tisserand was born at Flavigny-sur-Moselle (in 1830) and was a prominent figure in French agriculture for many years. Among his publications was the "Vegetation of high altitudes."—*O. A. Stevens*.

3266. ANONYMOUS. Obituary. Georg Schweinfurth. Nature 116: 685-686. 1925.—Schweinfurth was born at Riga, December 29, 1836, and died September 20, 1925. In 1866 he started on a 3-year trip into the Sudan from which he made extensive contributions to the knowledge of plants, animals, people and geography of Central Africa. Considerable of his time was spent in Egypt. He was an able writer and artist as well.—*O. A. Stevens*.

3267. ANONYMOUS. When American plants first went to Europe. Missouri Bot. Gard. Bull. 13: 139-143. Pl. 34-35. 1925.

3268. ANONYMOUS. The worlds scientific periodicals. [Rev. of: A world list of scientific periodicals published in the years 1900-1921. xii + 499 pp. Oxford University Press: London, 1925.] Nature 116: 419-421. 1925.

3269. BAALEN, J. VAN. Hoe de Lantana in Oost-Java kwam. [How the Lantana came to East Java.] Thee 6: 61-62. 1925.—The native names applied to Lantana are given. One of them is based on the name of Zollinger, a Swiss botanist and planter who brought it as an ornamental plant from Buitenzorg between 1855 and the time of his death in 1859. As a result of his importation the plant is now established and covers the foothills in the region.—*Carl Hartley*.

3270. BARTHOLOW, FRANCES A. *Abbreviations employed in Experiment Station Record for titles of periodicals.* U. S. Dept. Agric. Dept. Bull. 1330. 1-160. 1925.

3271. BATESON, W. *Science in Russia.* *Nature* 116: 681-683. 1925.—This is an account of a visit in attending the 200th anniversary of the Russian Academy of Science. Brief notes on work in agronomy, genetics and cytology are given.—O. A. Stevens.

3272. BRIQUET, JOHN. *Rapport sur l'activité au Conservatoire et au Jardin botaniques de Genève pendant les années 1922 et 1923.* [Report on the work of the Conservatory and Botanical Garden of Geneva during 1922 and 1923.] *Candollea* 1: 525-547. 1924.—The report includes personnel, plants received by the herbarium, the publications based upon work there, notes on the Burnat Herbarium and deCandolle Herbarium, accessions to the library, and the growth of the greenhouses and the garden.—A. S. Hitchcock.

3273. CHRIST, HERMANN. *Erinnerungen.* [Reminiscences.] *Verh. Naturf. Ges. Basel* 35: 3-18. *Portrait.* 1923.—After 4 pages of reminiscences, there is appended a 12-page bibliography of the author's botanical works.—C. W. Dodge.

3274. CIESLAR, ADOLF. Prof. Dr. Arnold Engler. *Centralbl. Gesam. Forstw.* 49: 251-255. 1923.—Engler (Jan. 29, 1869-July 15, 1923) taught forestry at the Technical College at Zürich from 1897, and was director of the Swiss Forest Exp. Sta., 1902-1923. He was author of many works on botanical and silvicultural subjects.—W. N. Sparhawk.

3275. DEGRULLY, P. *François Bernard.* *Prog. Agric. et Vitic.* 75: 6-8. 1920.

3276. [ENDRES, SCHÜPFER, UND FABRICIUS.] Dr. h.c. Arthur Georgi. *Forstwiss. Centralbl.* 47: 845-847. 1 pl. 1925.—Georgi has been head of the publishing firm, Paul Parey, since Parey's death in 1900. The firm has published over 5,000 books, including many in the fields of agricultural and biological science, besides several technical journals. A list is given of its important forestry publications.—W. N. Sparhawk.

3277. FARQUET, PH. *La part du Valais dans l'oeuvre du H. Christ.* [The influence of Valais on the work of H. Christ.] *Verh. Naturf. Ges. Basel* 35: 19-26. 1923.

3278. GAGER, C. STUART. *André Parmentier and the Brooklyn Botanic Garden.* *Science* 62: 461. 1925.

3279. HOLM, THEO. *Mark Alfred Carleton.* *Rhodora* 27: 172. 1925.—This is a notice of the death of M. A. Carleton (1866-1925), a distinguished American phytopathologist.—S. F. Blake.

3280. JOHNSON, PEHR. *Offerlundar och offerträd.* [Sacrificial groves and trees.] *Sko-gen* 12: 303-310. 3 pl. 1925.—Most large holy groves of oaks and beech, remnants of old Viking sun-worship, have disappeared, but their location can often be discovered by circles of hollowed stones. Several large isolated trees, still protected by superstitious peasants, may still be found, especially in Southern Sweden.—Henry I. Baldwin.

3281. J[ONES], D. A. *Edward Blanchard Chamberlain.* *British Bryological Soc. Rept.* 1: 181. 1925.—Chamberlain was born at Bristol, Maine, in 1878 and died at New York City in 1925. He was a teacher by profession but was deeply interested in bryology and acted as Secretary-Treasurer of the Sullivant Moss Society for many years. His publications deal mostly with the mosses of North America.—A. W. Evans.

3282. J[ONES], D. A. *Frederick Wright.* *British Bryological Soc. Rept.* 1: 182. 1925.—Wright was born at Sutton, County of Cambridge, England, in 1845 and died in 1924. He was a member of the South London Botanical Institute and took considerable interest in mosses.—A. W. Evans.

3283. J[ONES], D. A. *John Henry Crabtree.* *British Bryological Soc. Rept.* 1: 182. 1925.—Crabtree was born at Norden near Rochdale, England. His death occurred in June, 1924. For many years he held the position of factory inspector at Birmingham, West London, and elsewhere, but he took an active interest in the study of nature, including mosses, and became a member of the British Bryological Society.—A. W. Evans.

3284. KNOWLTON, CLARENCE H. *Edward Blanchard Chamberlain.* *Rhodora* 27: 73-76. 1925.—A biographical sketch of E. B. Chamberlain (1878-1925), best known as a bryologist, and long Secretary-Treasurer of the Sullivant Moss Society.—S. F. Blake.

3285. LO, CHI YUNG. [An index of Chinese biological literature for the past 20 years.] (Text in Chinese.) *Tsing-Hua-Hsueh-Pao* [Tsing Hua Journal-Publ.] 2: (Appendix)

1-41. Tsing Hua College: Peking, 1925.—An index of several hundred Chinese biological papers is compiled from 15 current Chinese journals, in each case giving full citation.—*Chunjen C. Chen.*

3286. LOESENER, TH. Eduard Seler. Nachruf. Verhand. Bot. Ver. Provinz Brandenburg 65: 78-83. 1923.—This is an account of the life of Eduard Seler (1849-1919) the noted anthropologist and ethnologist who on his Mexican, Central and South American expeditions collected over 6000 plants, many of which had never been seen or collected before.—*H. L. Blomquist.*

3287. MAO, Y. Bibliography of Chinese literature on agriculture. (In Chinese.) Univ. Nanking Publ. Library 1. 1-214. Nanking, China, 1924.

3288. MARTÍNEZ, MAXIMINO. Conferencia del Sr. Maximino Martínez en representación de la Dirección de Estudios Biológicos. [Speech of Señor Martínez, representing the Office of Biological Studies.] México Forest. 3: 152-154. 1925.—In this paper, delivered at a meeting commemorating the work of Aimé Bonpland, are listed the titles of a large number of works on the Mexican flora by French botanists.—*W. N. Sparhawk.*

3289. M[EGAW], W. R. James Glover. British Bryological Soc. Rept. 1: 183. 1925.—Glover was born in 1844 and died at Kircubbin, County Down, Ireland, in June 1925. Until 1910 he pursued the profession of teaching but devoted considerable attention to the study of mosses, hepatics and lichens, sending valuable contributions to the Moss Exchange Club from year to year.—*A. W. Evans.*

3290. MERRILL, E. D. An appeal for simplified literature citations. Science 62: 419-420. 1925.

3291. MOEWES, FRANZ. Hugo Conwentz. Verhand. Bot. Ver. Provinz Brandenburg 65: 1-4. 1923.—Hugo Wilhelm Conwentz, plant physiologist, paleobotanist, and protector of wild plant and animal life in Germany, died May 12, 1922 at the age of 70. This is a brief survey of his life and work.—*H. L. Blomquist.*

3292. NAKAI, T. The exact dates of publication of Miquel's Annales Musei botanici lugduno-batavi and Prolusio florum japonicae. Jour. Arnold Arboretum 6: 211-213. 1925.—The dates of publication of the 40 fascicles of the 1st and the 2 parts of the 2nd work mentioned in the title are given.—*Alfred Rehder.*

3293. PASTUREL, JOSEPH. Un naturaliste breton. François-Vincent Ferrary (1780-1842). [A naturalist of Brittany.] Trav. Sci. Univ. Rennes 16: 47-48. 1922.

3294. PASTUREL, JOSEPH. Un naturaliste breton, François-Vincent Ferrary (1780-1842). [A naturalist of Brittany.] Rev. Bretonne Bot. 1: 67-68. 1922.

3295. POWERS, WM. H. Some facts in the life of Thomas Nuttall. Science 62: 389-391. 1925.—On the basis of his own journal and those of his contemporaries, a corrected chronological table is developed.—*C. J. Lyon.*

3296. REINHARDT, CHARLES G. Northeast student is descendant of patriots famous in history. Northeast Alumni News 21: 12-17. 4 fig. 1926.—A discussion is given of the life of Joel Roberts Poinsett, after whom the genus *Poinsettia* is named, and of his descendants. He was born in Charleston, South Carolina, in 1779 and died in Statesburg, South Carolina, in 1851. He brought the *Poinsettia* from Mexico to Charleston, later selling plants to Robert Buist, a nurseryman of Philadelphia, by whom it was distributed.—*Wm. Randolph Taylor.*

3297. ROBINSON, B. L. Edward Lothrop Rand. Rhodora 27: 17-27. Portrait. 1925.—A sketch of the life and botanical activities of E. L. Rand (1859-1924), co-author of Rand and Redfield's Flora of Mt. Desert, and for many years corresponding secretary of the New England Botanical Club.—*S. F. Blake.*

3298. ROLDAN, ANGEL. Datos biográficos del célebre naturalista francés Amado Bonpland. [Biographical notes concerning Aimé Bonpland.] México Forest. 3: 155-156. 1925.

3299. ROTH. Eugen Vadas. Centralbl. Gesam. Forstw. 49: 52-55. 1923.—Vadas (1857-1922) was for many years professor of silviculture, forest zoology, and forest protection at the Schemnitz College of Mining and Forestry, and head of the Hungarian Forest Exp. Sta. at Sopron (Ödenburg), and was elected President of the International Union of Forest Exp. Stations in 1910. He was the author of numerous books and articles on silvicultural subjects, and edited the organ of the Exp. Sta., "Erdészeti Kísérletek," from its founding in 1898 until it was temporarily suspended in 1918.—*W. N. Sparhawk.*

3300. SÆLAN, TH. *Finlands botaniska litteratur till och med år 1900.* [The botanical literature of Finland before 1900.] Acta Soc. Fauna et Flora Fennica 43: 1-633. 1916.—A most complete catalogue of botanical works and papers published from 1643 to 1900 by Finnish authors or written by foreigners and published in Finland, either in the original or in translation. The chief catalogue is arranged alphabetically by authors but there is also a systematic survey including the various sections of botany, forestry, agriculture, horticulture and other branches of applied botany.—*Fredr. Elfving.*

3301. SCHRAMM, J. R. *Biological Abstracts.* Science 62: 533-536. 1925.—The new abstract journal, Biological Abstracts, will begin with the literature of 1926, the first issue to appear about June, 1926. The author's statement describes the details of the new organization and its plans for handling the subject matter of biology. The Central Office is located at the University of Pennsylvania, Philadelphia, Pennsylvania, U. S. A. The initial editorial personnel includes J. A. Detlefsen and Frederick V. Rand, Associate Editors; and J. R. Schramm, Editor-in-Chief.—*C. J. Lyon.*

3302. STEBBING, E. P. *Obituary.* J. S. Gamble. Nature 116: 684-685. 1925.—Gamble was born in London July 2, 1847, and educated at the Royal Navy School at New Cross and at Magdalen College, Oxford. He received his training in forestry at Nancy and in Scotland, going to India in 1871 where he remained until 1899. He held a prominent place as a botanist, forester and educator. Among his more important publications were: "A manual of Indian timbers," "Flora of the Presidency of Madras," and (with George King) "Materials for a Flora of the Maylan Peninsula."—*O. A. Stevens.*

3303. TAYLOR, WM. A. *Report of the Chief of the Bureau of Plant Industry.* 36 p. Government Print. Office: U. S. Dept. Agric., Washington, D. C., 1925.

3304. T[RAVIS], W. G., AND A. W[ILSON]. James Alfred Wheldon, M.Sc., A.L.S., I.S.M., 1862-1924. British Bryological Soc. Rept. 1: 178-180. 1925.—Although by profession a pharmacist, Wheldon devoted much attention to botany and especially to bryology. He was born at Northallerton, Yorkshire, and from 1891 to 1922 served as pharmacist at the prison in Liverpool. When the Moss Exchange Club was founded in 1896 he was one of the charter members, and he acted as treasurer of the Club for more than 20 years. His publications include more than 100 titles, those dealing with the harpidioid Hypna and the Sphagna being perhaps the most important.—*A. W. Evans.*

3305. UPHOF, J. C. TH. Abstracting old botanical works and manuscripts. Science 62: 545. 1925.—The value of thorough work in this field is advocated.—*C. J. Lyon.*

3306. WEAVER, LAWRENCE. *The Institute, 1917-24—A retrospect.* Jour. Nation. Inst. Agric. Bot. 3. 51-67. 1925.—The author briefly reviews origin and growth of the Institute and the work accomplished, including crop improvement, seed testing, and potato testing.—*Frederick V. Rand.*

BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

ARTHUR H. GRAVES, *Assistant Editor*

(See also in this issue Entries 3126, 3236, 3239, 3241, 3302, 3332, 3333, 3459, 3665, 3708, 3713, 4393)

3307. ANONYMOUS. [Rev. of: (1) OSBORN, H. F. *The earth speaks to Bryan*, vii + 91 p. Charles Scribners' Sons: New York and London, 1925; (2) THOMSON, J. ARTHUR. *Concerning evolution*. x + 245 p. Yale University Press: New Haven; Oxford University Press: London, 1925; (3) ANONYMOUS. *Evolution in the light of modern knowledge. A collective work.* xv + 528 p. 4 pl. Blackie and Son: London, Glasgow and Bombay, 1925.] Nature 116: 532-533. 1925.

3308. BUCH, H. *Herbarium. Anvisningar och råd beträffande insamling, konservering och förvaring av herbarieväxter.* [Directions and advice for the gathering, keeping, and preserving of plants for the herbarium.] Halger Schildts förlagsaktiebolag: Helsingfors, 1923.

—The statements apply to vascular plants; in addition, also, to mosses and lichens.—*Author* (translated).

3309. COVILLE, FREDERICK V. The proposed national arboretum at Washington [D. C.]. *Science* 62: 579-581. 1925.—This sets forth the nature, economic value and advantages, location, and cost of acquisition and maintenance of the proposed national arboretum, a bill for the authorization of which has been introduced in the House of Representatives and in the Senate (U. S. A.).—*A. H. Graves*.

3310. DUGGAR, JOHN FREDERICK. Southern forage crops. ix + 283 p. *Illus.* The Macmillan Co.: New York, 1925.

3311. DYMES, THOMAS ALFRED. The nature study of plants in theory and practice for the hobby-botanist. Introd. by F. E. WEISS. xviii + 173 p. *Frontispiece* + 5 pl., 30 fig. Soc. Promot. Christian Knowl.: London; Macmillan Company: New York, 1920.—In his introduction Weiss commends this book to teachers and students, in addition to the hobby-botanist for whom it was primarily intended by the author. It is divided into 2 parts, theory and practice, the 1st of which, after a chapter on nature-study, its objects and rules, deals with vegetable life as a whole under the 2 headings: "The life of the individual" and "The life of the race," the factors of the 1st being respiration, nutrition, growth, protection, and rest; and of the 2nd, reproduction and the care of the children—7 factors of life in all. In the 2nd part the life-history of the Herb Robert (*Geranium Robertianum* L.) is followed, special attention being paid to the vegetative organs, the dangers to which the plant is exposed, protection, and seed-dispersal. Three more chapters dealing with the comparative biology of a variety of the Herb Robert and of the Stork's-bill (*Erodium cicutarium* (L.) l'Hér.) are followed by a short "Conclusion," a table setting forth the pollination, first-instance dispersal, and seed-anchorage of the species dealt with in Part II, and by an Index. There is also at the beginning of the book an alphabetical list of the plants referred to in the text by popular name, followed in each case by the scientific name.—*Author*.

3312. FEDTSCHENKO, BORIS. The Principal Botanical Garden, Leningrad. *Nature* 116: 800-801. 1925.—This garden was founded in 1713 as a Druggists' Garden, reconstructed in 1824 as the Imperial Botanical Garden, and renamed as above in 1917. The work of the garden at present is reviewed. The herbarium contains 3,000,000 specimens, and a flora of Asiatic Russia is being compiled. Seed testing and investigation are included among its activities. The library is the richest in the country.—*O. A. Stevens*.

3313. GLENN, EARL R., ASSISTED BY JOSEPHINE WALKER. Bibliography of science teaching in secondary schools. U. S. Dept. Int. Bur. Ed. Bull. 1925¹³: 1-161. 1925.—"The recent rapid advance of the natural sciences has overwhelmed us with a vast array of new information and new deductions. Much of this must somehow get presented in our schools. Science writers have been bringing this new material before the public at a rate far more rapid than it is possible or desirable to build it into school curricula. . . . The council of the American Association for the Advancement of Science, at its Cincinnati meeting in December, 1923, authorized a special committee to make a study of the rôle played and to be played by science in education. That committee was organized in 1924, and the presentation of this bibliography is the first tangible evidence of its work." It comprises references to magazine articles bearing upon those sciences most generally taught in secondary schools, and includes titles up to the earlier publications of the year 1925.—*A. H. Graves*.

3314. GRAMET, CHARLES. Biology. 102 + 21 p. *Illus.* Globe Book Co.: New York, 1921.—"The author has endeavored to compile a book in which the essentials of elementary biology are clearly, compactly, and concisely presented." In the last 21 pages, examination papers are given for the different phases of the subject.—*Frederick V. Rand*.

3315. JARVIS, C. D. Agricultural education. U. S. Dept. Int., Bur. Ed. Bull. 1921⁴⁰: 1-26. Washington, D. C., 1921.

3316. JOHN, WALTON C. Statistics of agricultural and mechanical colleges for 1919 and 1920. U. S. Dept. Int., Bur. Ed. Bull. 1922²⁷: 1-29. Washington, D. C., 1922.

3317. MAXON, WILLIAM R. Ferns as a hobby. *Nat. Geog. Mag.* 47: 541-586. 29 *illus.* (16 col.) 1925.—A description of ferns growing in America and in other countries. Their reproductive habits are explained and general specific descriptions accompany the copies in color of paintings by E. J. Geske.—*W. M. Atwood*.

3318. RITCHEY, G. E. **A study of weeds.** Univ. of Nanking, Agric. and Forest. Ser. 1st: 1-25. 5 *pl.* 1922.—This bulletin is written in simple language for use in the primary school grades. It sets forth briefly what weeds are, their uses, the damage they cause, how they spread, their classification, and how to combat them. A few examples are given and suggestions for teachers are included.—*Albert N. Steward.*

3319. ROSS, ROLAND CASE. **Primary nature study.** Vol. 1. Grades 1 and 2. 41 *p.* *Illus.* (mimeographed); **School nature study.** Vol. 1. Grades 3-8. 41 *p.* *Illus.* (printed). Pub. by author: Pasadena, California, 1925.—Each of these brochures contains a series of 40 lessons for teachers in California schools. Most deal with plants and animals, although other subjects, such as, "A constellation, water, earth," are also considered. Each weekly lesson suggests methods of obtaining material, manner of presentaion to the class, facts for the use of the teacher, and references.—*Charlotte S. Young.*

3320. WORKS, GEORGE A. **Agricultural education.** U. S. Dept. Int., Bur. Ed. Bull. 1923¹⁹: 1-21. Washington, D. C., 1923.

3321. WORKS, GEORGE A. **Agricultural education.** U. S. Dept. Int., Bur. Ed. Bull. 1925²²: 1-11. Washington, D. C., 1925.—This considers the changing status of agricultural teaching in elementary schools, the present condition of vocational boys' and girls' clubs, the growing vocational agricultural work in high schools, and the decreasing number of agriculture students in agricultural colleges.—*Charlotte S. Young.*

CYTOLOGY

GILBERT M. SMITH, *Editor*

(See also in this issue Entries 3271, 3563, 3566, 3575, 3591, 3592, 3609, 3620, 3625, 3726, 3729, 3730, 3754, 3810, 3812, 4191, 4202, 4203, 4211, 4220)

3322. ABELE, KARLIS. **Sur les nucléoles des cellules radicales de *Vicia amphicarpa* Dorthes.** [The nucleoles of the root cells of *V. amphicarpa*.] *Comp. Rend. Soc. Biol.* 92: 887-888. 1 *fig.* 1925.—If the roots are grown at a temperature a bit above normal, such as 15°C., the nucleole occupies a larger part of the nucleus than ordinarily; when grown at 28°C. the nucleoles nearly fill the entire nucleus. They do not divide unless the cell and nucleus have previously divided, so that the presence of 2 nucleoli in a nucleus in this species shows that the nucleus has divided. This would indicate some karyokinetic function of the nucleolus and would lead to the conclusion that the nucleolus is not merely an accumulator of reserve material.—*Oran Raber.*

3323. ARNDT, ARTHUR. **Rhizopodienstudien II.** [Rhizopod studies II.] *Zeitschr. Wiss. Biol. Abt. B, Zeitschr. Zellforsch. u. Mikroc. Anat.* 2: 651-702. 5 *pl.*, 4 *fig.* 1925.—A certain amoeba was used which could be easily grown upon agar. One or more nuclei are present and these have considerable variation in form. Most of the resting nucleus is occupied by a central nucleolus ("*Binnenkörper*"), the remainder being rather clear and transparent except for a ring of particles just within the nuclear membrane—the "nuclear girdle." At one side of the nucleus in the cytoplasm, is an indefinitely outlined body, the "*Nebenkörper*." This seems to arise from the ends of the spindle fibers of the previous mitosis, but its relation to the subsequent nuclear division is not clear. It seems to give rise to a centrosome-like body during prophase, which disappears before the spindle is formed. The origin of the chromosomes and their location during the resting stage is obscure. The nuclear girdle may account for part of the chromosome material, inasmuch as it vanishes about the time that the granules appear throughout the nucleus, which later become a part of the spireme. During prophase, the "*Binnenkörper*" disintegrates, and in anaphase is cast out into the cytoplasm. The chromosomes are organized from a spireme which appears in prophase. In the reconstitution of the daughter nuclei, droplets appear which fuse together to form the new "*Binnenkörper*," which therefore does not arise from the chromosomes. In some individuals there is more than one nucleus, 50 being the highest number observed. These are usually clustered into larger or smaller groups. When 2 nuclei are present, there is usually but one "*Nebenkörper*," between and against the nuclei. If 3 nuclei are present,

there is usually a single "Nebenkörper" in the center of the cluster. In larger groups, the "Nebenkörper" are also fused, although as a rule not all are fused into one body. All of the nuclei in a cell divide together, the highest number of simultaneous divisions observed being 15. When the spindles are formed, nuclei in clusters are generally so arranged as to have one or more poles in common. Sometimes, however, the various spindles are lined up side by side, or the coupling may involve various combinations of the spindles. Separation of the daughter chromosomes in anaphase takes place at the same moment in the various nuclei in a group. Polyploid nuclei are seen in about one individual in 10,000. Such nuclei are larger than the average, and mitosis is normal if the number of chromosomes is not greater than 4 times the normal number. Such giant nuclei may have arisen through a fusion of resting nuclei, or of spindles at the end of metaphase, or of the daughter nuclei of coupled spindles; or through the failure of daughter chromosomes to separate in poleless mitoses. —*Ralph E. Cleland.*

3324. AVEL, MARCEL. Quelques méthodes d'imprégnation osmique de l'appareil de Golgi. [Some methods of impregnating the Golgi apparatus with osmium.] *Compt. Rend. Soc. Biol.* 92: 1500-1502. 1925.

3325. BRAMBELL, F. W. ROGERS. The part played by the Golgi apparatus in secretion, and its subsequent reformation in the cells of the oviducal glands of the fowl. *Jour. Roy. Microsc. Soc. London* 1925: 17-30. 2 pl. 1925.—The Golgi apparatus in the cells of the alveolar glands in the wall of the oviduct is actively concerned in the secretion of the albumen granules. It undergoes hypertrophy during periods of activity, and reduction during periods of rest, but is not extruded from the cell. In the ciliated epithelium of the oviduct, however, which is also secretory, the Golgi apparatus fragments during secretion, and is extruded from the cell with the secretion. The apparatus is then reconstituted *de novo*. —*Ralph E. Cleland.*

3326. CASTETTER, EDWARD F. Studies on the comparative cytology of the annual and biennial varieties of *Melilotus alba*. *Amer. Jour. Bot.* 12: 270-286. 3 pl. 1925.—These 2 varieties are clearly distinct physiologically but are identical cytologically, each having 8 pairs of chromosomes, and the cell divisions preceding the formation of pollen grains being similar in each. The daughter nuclei at the end of the heterotypic division are completely reorganized before the homoeotypic division begins. Quadripartition of the pollen mother-cell results from furrows. These are formed largely by a system of vacuoles that are met by ingrowing surface furrows, a process not unlike that described for certain fungi but not before reported in microsporogenesis in higher plants. The formation of cell plates across the equator of the spindles was never observed. Giant pollen grains were found, each being the entire product of a single mother-cell.—The annual variety probably arose from the biennial, but whether through hybridization or mutation the author is uncertain.—*E. W. Sinnott.*

3327. DANGEARD, P. Observations cytologiques sur les poils foliaires à forme de paraphyses des *Polytrichs*. [Cytological observations on foliar hairs with the form of paraphyses in *Polytrichum*.] *Bull. Soc. Bot. France* 72: 125-130. fig. 1-7. 1925.—There are axillary hairs in the leaves of *Polytrichum* that are not associated with the sexual organs and are not, in consequence, paraphyses. These hairs are also found intermingled with the true paraphyses of antherids and of archegones. They present a very good example of uncolored mitoplasts. According to a certain school these colorless bodies represent plastids that have returned to the elemental state of the chondriome but this is not the case.—*J. Beauverie (translated).*

3328. DANGEARD, P. Plastes et cytosomes chez le *Fontinalis antipyretica*. [Plastids and cytosomes in *Fontinalis antipyretica*.] *Bull. Soc. Bot. France* 72: 5-9. Pl. 1. 1925.—Plastids and cytosomes are very distinct from one another in the apical cell. The plastids are probably chloroplasts; the cytosomes rarely undergo elongation and do not undergo a transformation into plastids. Plastids and cytosomes should be regarded as 2 distinct categories.—*J. Beauverie (translated).*

3329. EILERS, WALDTRAUT. Somatische Kernteilungen bei Coleopteren. [Somatic nuclear divisions in the Coleoptera.] *Zeitschr. Wiss. Biol. Abt. B, Zeitschr. Zellforsch. u.*

Mikrosc. Anat. 2: 593-650. 102 fig. 1925.—Somatic mitoses are described in the fat bodies and in the carotin tissue of the wing sheaths of imagoes of *Melasoma vigintipunctatum*, and in larval fat bodies and embryonic cells of *M. populi*. The only difference in the mitoses of adult and larval fat bodies lies in the multipolar condition of the early spindle in the former. They are alike in having short spindles and in lacking centrioles, centrosomes and polar radiations. Mitoses in embryonic cells likewise lack centrioles and polar radiations, but differ in having a narrower spindle. Nuclear fusions, and subsequent mitotic divisions of the resultant giant nuclei are described. Amitosis occurs as well as mitosis in the carotin tissue. The author concludes, after a comparative study of mitoses in animals and plants that in most cases cell division is initiated fully as much through cytoplasmic as through nuclear influences, although extremes are found on the one hand in which the cytoplasm is apparently entirely passive, and on the other hand in which cell division may occur without corresponding nuclear division. The problems of "mitotic pressure," chromosome organization, the nature and polarity of the spindle, and the centrospheres are discussed.—*Ralph E. Cleland*.

3330. EPHRUSSI, BORIS. Sur le chondriome ovarien des *Drosophila melanogaster* et simulans. [The ovarian chondriome in *D. melanogaster* and simulans.] Compt. Rend. Soc. Biol. 92: 778-780. 1925.

3331. GIGLIO-TOS, ERMANNO. La pretesa migrazione dei cromosomi verso i poli durante l'anafase della cariocinesi. [The assumed migration of the chromosomes towards the poles during the anaphase of karyokinesis.] Atti R. Accad. Lincei Roma [Rendiconti. Cl. Sci. Fis. Mat. e Nat.] 33¹: 316-320. 1924.—Measurements from the drawings of Boveri confirm the author's views that the chromosomes do not migrate towards the poles during the anaphase but remain at a constant distance.—*F. M. Blodgett*.

3332. HERRERA, A. L. Sull'imitazione della struttura del protoplasma e la divisione cellulare. [Imitation of the structures of protoplasm and of cell division.] Atti R. Accad. Lincei Roma [Rendiconti Cl. Sci. Fis. Mat. e Nat.] 32²: 433-438. 1923.—Work previously reported (Ibid. 32¹: 508. 1923) on the production from synthetic mixtures of structures resembling cells, nuclei and protoplasm, was continued. A mixture containing alcohol, sulphuric ether, starch, pyroxilin and linseed oil, when poured on a glass plate on which small objects had been placed to modify the surface tension, produces very surprising imitations of cell division figures and of delicate protoplasmic structure. These figures can be dried, stained and preserved between 2 panes of glass, as transparencies. These results demonstrate the importance of mechanical causes in the life and division of cells.—*F. M. Blodgett*.

3333. HERRERA, ALFONSO. Sull'imitazione della struttura del protoplasma e la divisione cellulare. Nota III. [Imitation of the structure of protoplasm and of cell division.] Atti R. Accad. Lincei Roma [Rendiconti Cl. Sci. Fis. Mat. e Nat.] 33¹: 101-102. 1924.—A synthetic mixture consisting of alcohol, ether, ivory black or ultramarine blue, pyroxilin and linseed oil is poured on a glass plate. If the liquid is continually taken up by 2 pipettes, 1 on each side, and if a few drops of dilute alcohol are added from a capillary pipette, the mixture gives rise to a figure which imitates the prophase of karyokinesis.—*F. M. Blodgett*.

3334. IKARI, J. On the nuclear and cell division in a Plankton diatom *Coscinodiscus subliens*, Jörgensen (preliminary note). Bot. Mag. Tôkiô 37: 96-108. Pl. 3-4, 2 fig. 1923.—The writer describes the cellular structure of a marine diatom, *Coscinodiscus subliens*, and its nuclear and cell division. Before the nuclear division, each chromatophore divides into 2 equal halves by a constriction in the middle. In an early stage of mitosis the nucleus, which usually lies at the center of the epitheca, migrates towards the girdle region and there occupies a new position almost in contact with the cell wall. The number of chromosomes has not been definitely established but it seems to lie between 12 and 20. The mitosis proceeds as usual and at the late telophase a cell plate is produced between the daughter nuclei. No centrosome has been found in connection with the nuclear division.—*T. Fukushi*.

3335. JASSWOIN, G. Zur Histophysiologie der Tubuli contorti der Amphibienniere. [Histology and physiology of the tubuli contorti of the amphibian kidney.] Zeitschr. Wiss. Biol. Abt. B, Zeitschr. Zellforsch. u. Mikrosc. Anat. 2: 741-765. 19 fig. 1925.—The epithelium of the tubules in the amphibian kidney carries on both secretion and reabsorption.

The Golgi apparatus, which is a constant feature of the cells of this tissue, gives them their ability for secretion and storage.—*Ralph E. Cleland.*

3336. JOYET-LAVERGNE, PH. Sur l'appareil de Golgi des sporozoïtes de Grégariens. [The Golgi apparatus in the sporozoites of Gregarines.] *Compt. Rend. Soc. Biol.* 92: 1185-1188. 1925.

3337. KARPOVA, LYDIA. Beobachtungen über den Apparat Golgi (Nebenkernel) in den Samenzellen von *Helix pomatia*. [The Golgi apparatus (Nebenkernel) in the sperm cells of *Helix pomatia*.] *Zeitschr. Wiss. Biol. Abt. B, Zeitschr. Zellforsch. u. Mikrosk. Anat.* 2: 495-514. 1 pl. 1925.—There may be seen in the living plasma of all stages in sperm cells of *Helix pomatia* 3 sorts of bodies—dictiosomes, mitochondria, and granules which stain with neutral red. Dictiosomes and mitochondria take the typical mitochondrial stains. The former correspond to the pseudomitochondrial bodies described by Guillermond in plant cells, and are distinguishable from mitochondria only in that they reduce osmium and are blackened by silver more quickly than are mitochondria, and also in that they tend to be associated with the archoplasm in the cell, whereas mitochondria do not. They are perhaps mitochondria which at the moment are in the act of forming secretions. The granules which take the neutral red are vacuoles, corresponding to the vacuole system observed in plants by Dangeard and Guillermond, and in animal cells by Accroier, and Parat and Painlevé. They represent the archoplasm of fixed material, and are different from the Golgi apparatus.—*Ralph E. Cleland.*

3338. KIHARA, H., AND T. ONO. Cytological studies on *Rumex* L. I. Chromosomes of *Rumex Acetosa* L. (Japanese.) *Bot. Mag. Tôkiô* 37: (84)-(90). 1 fig. 1923.—The diploid number of chromosomes of *Rumex Acetosa* L. was 15 in a male plant, although the writers could not determine whether all the male plants invariably had 15 chromosomes. The number of chromosomes in the same plant was previously reported by Roth (1906) to be 8(x) and 16(2x) in both male and female plants. The number of chromosomes of the other species of *Rumex* are, according to several investigators, in multiples of 8. The writers describe the behavior of chromosomes in heterotypic and homotypic nuclear divisions in the pollen mother cells. In the heterotypic metaphase there are found 6 bivalent autosomes and 1 tripartate chromosome. During the maturation division the latter behaves like the idiochromosome of the mantis (Oguma, 1921). The tripartate chromosome consists of 3 parts, m_1 , M, and m_2 , connected end to end. In the heterotypic anaphase it does not divide longitudinally but transversely, and M, thus separated, moves towards one of the poles, while m_1 and m_2 move towards the other. The M chromosome is the largest of all the daughter chromosomes and accordingly distinct from the other, but m_1 and m_2 , which are much smaller than M, are not easily distinguished from the autosomes either in size or form. In the homotypic division, 7 or 8 chromosomes make their appearance in different nuclear plates, and the M-chromosome is always found in the nuclear plate with 7 chromosomes. Accordingly the number of chromosomes in the pollen is 7 or 8 with the formulae, $7 = 6a + M$, and $8 = 6a + m + m$, a representing the autosomes. The number of chromosomes in the root tip cells of 28 plants of unknown sex was determined as 14 and 15, in 25 and 3 plants, respectively. (In the field the female plants are met with more frequently than the male.) Among these 15 chromosomes 1 large chromosome can be found, while 2 occur among the 14 chromosomes. These large chromosomes show remarkable resemblance to the M-chromosome in the male plant, as mentioned above. It would be interesting to determine whether all the 15-chromosomed plants are male and the 14-chromosomed ones, female.—*T. Fukushi.*

3339. LAGUESSE, E., ET A. DEBEYRE. A propos de chondriome et de grains de sécrétion. [The chondriome and the secretory granules.] *Compt. Rend. Soc. Biol.* 92: 445-446. 1925.—This is a discussion of the paper by Parat and Painlevé. (See this issue, Entry 3346.)

3340. LITARDIÈRE, R. DE. Les diverses étapes de "l'agonie" des noyaux sous l'influence d'une température élevée. [The different stages in nuclear injury under the influence of high temperatures.] *Compt. Rend. Soc. Biol.* 92: 796-798. 1925.—Roots of *Allium cepa* were heated (1) 24 hours at 48°C., (2) 24 hours at 50°, and (3) 60 hours at 50°. The progressive changes noted are as follows: (1) The chromosome material stains very strongly. The nucleolus loses its chromatophile material and only shows an achromatophile substratum.

(2) The chromosome material in the nuclei at the edge of the roots dissolves. (3) This extends to all the nuclei, accompanied by extreme plasmolysis. The nucleus becomes very small with an irregular outline.—*Oran Raber*.

3341. LUDFORD, R. J. Some modifications of the osmic acid methods in cytological technique. Jour. Roy. Microsc. Soc. London 1925: 31-36. 1 fig. 1925.—Employing hot water to bring about reduction of the osmic acid in the demonstration of the Golgi apparatus causes much less non-specific reduction than when the osmic acid is heated, and impregnation is remarkably uniform. By this method, both mitochondria and the Golgi apparatus can be stained in the same cell. A summary of the method is given.—*Ralph E. Cleland*.

3342. LUDFORD, REGINALD J. The general and experimental cytology of cancer. Jour. Roy. Microsc. Soc. London 1925: 249-292. 21 fig. 1925.—After a brief description of the nature of tumor growth and a review of theories regarding the origin and cause of cancerous growth, the author gives a detailed account of the appearance and behavior of the various cell organs under different conditions of tumor growth. Particular attention is given to the Golgi bodies and to nuclear phenomena. The general conclusion reached is that with our present technique there is no way of distinguishing morphologically between normal and cancerous cells. The work of Gye and Barnard is discussed. New methods of research will have to be devised before the possibilities opened up by the work of these investigators can be explored cytologically.—*Ralph E. Cleland*.

3343. PALMER, RICHARD. The chromosome complex of *Gammarus chevreuxi* Sexton. Nature 116: 785. 1925.

3344. PARAT, M., ET P. BERGEOT. Sur le prétendu contenu lipoidique de l'appareil de Golgi. [The Lipoid content claimed for the Golgi apparatus.] Compt. Rend. Soc. Biol. 92: 868-870. 1925.—The Golgi apparatus is not made of lipoids. Dietrich's technique not only shows this but also shows its vacuolar structure (vacuome).—*Oran Raber*.

3345. PARAT, M., ET J. PAINLEVÉ. Rôle du vacuome (Appareil de Golgi) et du chondriome dans la formation des grains de sécrétion. [The rôle of the vacuome (Golgi apparatus) and of the chondriome in the formation of the secretory granules.] Compt. Rend. Soc. Biol. 92: 65-67. 1925.—Observations on the pancreas of fish and amphibians as well as on the salivary glands of insect larvae have led to the conclusion that the vacuome is the only producer of granules of secretion. There is no direct transformation of the chondriome into these granules. The chondriome is doubtless as necessary as the nucleus but its function is unknown.—*Oran Raber*.

3346. PARAT, M., ET J. PAINLEVÉ. Vacuome, chondriome, et grains de sécrétion. [The vacuome, chondriome, and secretory granules.] Compt. Rend. Soc. Biol. 92: 767-768. 1925.—This is a reply to Laguesse and Debeyre. (See this issue, Entry 3339.)

3347. SINOTO, YOSITO. Notes on the histology of a giant and an ordinary form of *Plantago*. Bot. Mag. Tôkyô 39: 159-166. 2 fig. 1925.—*Plantago japonica* is a giant form, when compared with *P. major* and *P. major* var. *asiatica*. Its cells, however, are of the same size, in general, as those of *P. major* var. *asiatica*, its nuclei are smaller, and it possesses but $\frac{1}{2}$ the number of chromosomes found in this form, namely $2x = 12$. Its larger size is due, therefore, to a larger number of cells.—*Ralph E. Cleland*.

3348. СТЕПОВЕ, И. La spermatogénèse chez la *Nepa cinerea*. [Spermatogenesis in *N. cinerea*.] Compt. Rend. Soc. Biol. 92: 1476-1478. 4 fig. 1925.

3349. STOLZE, KARL VIKTOR. Die Chromosomenzahlen der hauptsächlichsten Getreidearten nebst allgemeinen Betrachtungen über Chromosomen, Chromosomenzahl und Chromosomengrösse im Pflanzenreich. [Chromosome numbers of the principal species of cereals, together with general consideration on chromosomes, chromosome number and chromosome size in plants.] In: Bibliotheca Genetica. Edited by E. BAUR. Bd. 8: 1-71. 54 fig. Gebrüder Borntraeger: Leipzig, 1925.—The author discusses the following: Chromosome numbers mentioned in previous botanical literature and chromosome numbers found by the author in *Secale*, *Triticum*, *Hordeum* and *Avena*, the formation and structure of chromosomes in plants, and discussions of the various chromosome numbers attributed to these cereals, and of chromosome number and size in plants in general. The author's motive was to clear up, if possible, the contradictory statements concerning chromosome number in cereals.

This, as a result of his investigation, he believes to have done and also to have shown a relationship between chromosome number and size.—*Frederick V. Rand.*

3350. TAHARA, M. Embryonic development in *Sargassum Horneri*, Tur. (preliminary note). (Japanese.) Bot. Mag. Tôkiô 37: (159)–(161). 1923.—The oogonium of *Sargassum Horneri* Tur. has 8 nuclei after discharge from the conceptacle; 6 of these nuclei degenerate and disappear but the other 2, gradually increasing in size, migrate to opposite ends of the oosphere. The oospore divides into 2 cells in which the first nuclear divisions take place simultaneously. Contrary to the usual conception, the uni-nuclear stage of the oospore is not found.—*T. Fukushi.*

3351. TAYLOR, WM. RANDOLPH. Chromosome constrictions as distinguishing characteristics in plants. Amer. Jour. Bot. 12: 238–244. 1 pl., 5 fig. 1925.—Spindle-fiber-attachment constrictions of the chromosomes were not found in *Pitcairnia xanthocalyx*, *Aechmea conspicui-armata*, *Cleome spinosa* or in the smaller chromosomes of *Yucca filamentosa*, but were observed in the larger chromosomes of the last species and in *Fagopyrum esculentum*, *Coix Lachryma-Jobi*, *Eichhornia speciosa*, *Sagittaria montevidensis*, *Crepis capillaris*, *C. setosa* and *Aloë saponaria*. In the last 3 species chromosome "satellites" were observed. In general, constrictions were much more obvious in large than in small chromosomes, though often they may be demonstrated in the latter.—*E. W. Sinnott.*

3352. TAYLOR, WM. RANDOLPH. Cytological studies on *Gasteria* II. A comparison of the chromosomes of *Gasteria*, *Aloë*, and *Haworthia*. Amer. Jour. Bot. 12: 219–223. 13 fig. 1925.—*Gasteria* spp., *Aloë arborescens* and *Haworthia cymbiformis* are alike in having 7 pairs of chromosomes which differ considerably in size and also in shape, certain of them having characteristic constrictions. Each genus may be distinguished by these chromosomal characters and it is suggested that a grouping of species based on such traits would in general correspond to that adopted by taxonomists.—*E. W. Sinnott.*

3353. WICKSELL, S. D. The corpuscle problem. A mathematical study of a biometric problem. Biometrika 17: 84–99. 1925.—Derives the frequency distribution of the true diameters of spherical corpuscles in a tissue from the distribution of diameters as measured in a microtome section.—*J. R. Miner.*

ECOLOGY

GEO. D. FULLER, *Editor*

(See also in this issue Entries 3122, 3135, 3143, 3210, 3244, 3254, 3262, 3269, 3481, 3482, 3484, 3487, 3493, 3497, 3501, 3502, 3507, 3511, 3616, 3676, 3741, 3742, 3745, 3750, 3751, 3755, 3765, 3780, 3787, 3788, 3795, 3796, 3868, 4181, 4234, 4235, 4249, 4286, 4287, 4336, 4337, 4366, 4382, 4397, 4406, 4408)

GENERAL, FACTORS, MEASUREMENTS

3354. ANONYMOUS. Guide books for the naturalist. [Rev. of: (1) HOFFER, MAX, AND LUDWIG LÄMMERMAYR. Salzburg. xvi + 406 p. (Junk's Natur-Führer.) W. Junk: Berlin, 1925; (2) FRIESE, WALTHER. Sächsische Schweiz. x + 354 p. 3 charts. (Junk's Natur-Führer.) W. Junk: Berlin, 1925.] Nature 116: 707. 1925.

3355. ATKINS, W. R. G., AND G. T. HARRIS. Seasonal changes in the water and heleo-plankton of fresh-water ponds. Notes Bot. School Trinity Coll. Dublin 3: 281–301. 1925.—The seasonal changes in the heleo-plankton of two fresh-water ponds have been compared with alterations in the solutes. (For details see Bot. Absts. 14, Entry 3292.)—In the Staddon pond *Tetradon minimum* was usually dominant, and occurred in nearly pure growth; as many as 8,000 per cc. were found in May. *Microcystis aeruginosa* was very abundant in August, 1923, *T. minimum* having disappeared. In October and November the latter and *Sphaerella lacustris* were abundant. Ninety species of algae, including varieties, are recorded from this pond.—In the Borough Farm quarry pond, Antony, only 28 species were found, of which 17 occur also in Staddon. The pond is at times rich in diatoms; *Synedra pulchella* was found late in April in amounts up to 32,000 per cc. A scum on the surface at the same period contained *Euglena viridis*, 46,000 per cc., and *Chlamydomonas globosa*, 5,800,-

000 per cc. as counted by the haemocytometer. *Peridinium anglicum* is also present, being especially abundant in autumn.—*Spirogyra porticalis* was observed with laterally fused chloroplasts and *S. varians* with twin zygospores in 1 gametangium. The rare alga, *Elakatothrix gelatinosa* Wille, was found in Staddon reservoir. The infusorian, *Salpingoeca napiiformis*, was discovered as an epiphyte on the unicellular *Lagerheimia genevensis*. A transparent cellular sheet was formed by the encystment of *Euglena viridis* in great numbers.—*Geo. B. Rigg.*

3356. ATKINS, W. R. G., AND H. W. HARVEY. The variation with depth of certain salts utilized in plant growth in the sea. *Nature* 116: 784-785. 1925.—A table is presented showing the analyses of samples taken at 37° 44' N., 13° 21' W. on Oct. 12 down to 3000 meters. The temperature showed a decrease of 21.1° to 3.1°C., the alkalinity of 8.35 to 7.87; P₂O₅ increased with the depth from 0 to 88, nitrate N about 10 to 265, and SiO₂ from 220 to 1200 parts per million, respectively.—*O. A. Stevens.*

3357. AUER, VÄINÖ. *Phragmites communis* (L.) auf den Mooren von Kuusamo und Kuolajärvi. [P. communis in the moors of Kuusamo and Kuolajärvi, Finland.] *Ann. Soc. Zool.-Bot. Fennicae Vanamo* 1: 305-320. 1923.—In eastern North Finland *Phragmites* always grows either in ponds or at the edges of swamps resulting from former ponds or on shore elevations covered with peat near which former lakes may be recognized. Here the plant is a geomorphological relic coming in during the "Präälignier" period.—*K. Linkola (translated).*

3358. BLANCHET, G. H. An exploration into the northern plains north and east of Great Slave Lake, including the source of the Coppermine River. *Canadian Field Nat.* 38: 183-187. 1924; 39: 12-16, 30-34, 52-54. *Fig. 1-8.* 1925.—Although restricted, the vegetation supports abundant animal life. Soil and climatic conditions are important factors governing its character but topography is of paramount importance, and is of assistance in explaining the location of the line between the forests and the "Barren Lands." Spruce and tamarack at the "lost woods" are dwarfed or developed according to the shelter afforded. Dwarfs exceeding 300 years in age are found with the annual rings almost microscopic but widest on the southwest or sheltered side. Grass is sparse on exposed, rocky or coarse drift soil, but abundant in bottom lands where soil and moisture conditions are favourable.—*H. Groh.*

3359. BRAUN-BLANQUET, J., ET RENÉ MAIRE. Études sur la végétation et la flore marocaines. [Vegetation and flora of Morocco.] *Mem. Soc. Sci. Nat. Maroc* 8: 1-244. *Pl. 1-10, map.* 1924.—Three floristic areas are distinguished and designated: (1) Mediterranean-Lusitanian Domain (in part in northwestern Rif); (2) Atlantic-Mauritanian Domain, containing a Macronesian element; and (3) Mauritanian Steppe Domain. An annotated list is given of all plants obtained during a collecting trip of the Botanical Society of France in 1921.—The principal plant associations are described and lists of their species are given, including an indication of the life form (Raunkiaer's), quantity and sociability of each species.—The principal vegetational regions based on climate and association type are: (1) High plateau steppe with transition to desert in the north-east, having a rainfall of less than 300 mm. resulting in the absence of trees and the reduction of shrubs to occasional shrubs of *Zizyphus lotus*. Most vegetation consists of annuals, hemicyptophytes and geophytes among which *Eruca longirostris* (Cruciferae), *Artemisia herbaalba* and *Asphodelus* spp. are conspicuous examples. (2) Southern steppe passing to desert at the south-west. Here shrubs of *Zizyphus lotus*, *Lycium intricatum*, and other xerophytic species are more abundant with numerous grasses. The area includes extensive alkaline plains with an evergreen scrub of *Atriplex halimus*, *Suaeda fruticosa*, and *Salsola vermiculata*. (3) Cork oak forest-region with *Quercus suber* and a rich undergrowth of *Ulex*, *Lavandula* and *Cistaceae*. Here is also found an endemic wild pear, *Pyrus mamorensis*. The rainfall is 300-500 mm. (4) Dwarf palm scrub developed in the basin of the Sebou River with a rainfall about equal to the preceding. The original vegetation, probably forest, is almost completely replaced by cultivation and by a grassy scrub of *Chamaerops humilis*. In some parts of the region *Nerium oleander* is common. (5) South-eastern Morocco with a rainfall of 300-400 mm. and a vegetation consisting largely of a low forest or maquis in which the larger species are *Argonia sideroxylon*, *Olea europaea*, *Pistacia atlantica* and *Callitris articulata*. (6) Lower

Atlas (Moyen Atlas) with forests of *Quercus Ilex* from 1000 m. to 1700 m., above which *Cedrus atlantica* becomes dominant. Between the live oak and the cedar there is frequently a narrow zone of the semi-deciduous *Quercus lusitanica* var. *maroccana*. (7) Grand Atlas with a xerophytic vegetation at lower altitudes, in which *Euphorbia resinifera*, *Polygala*, *Balansae*, and *Lotononis maroccana* are conspicuous. At 900–1000 m. a forest of *Callitris articulata*, *Olea europaea*, *Juniperus phoenicea* and *J. oxycedrus* develops. Many variations of the principal types and many associations of lesser extent are also described.—*Geo. D. Fuller*.

3360. BRYAN, OLLIE C. **Effect of different reactions on the growth and nodule formation of soybeans.** *Soil Sci.* 13: 271–287. 15 pl. 1922.—The plants were grown in nutrient solutions and in sand to which the solutions were added daily. In both instances the solutions were adjusted by adding varied amounts of acid or alkali. Shive's solution proved favorable for growth in sand but not in solution cultures, while Crone's was favorable for both. The most favorable reaction for growth and inoculation of the soybeans was pH 6.5, while the limits for growth were pH 3.9 and 9.6. The limits for nodule formation were slightly less than for growth of the host plant. The cowpea has apparently a greater range of reaction at which nodules may be formed than the soybean.—*Geo. D. Fuller*.

3361. BUEN, ODON DE. **Rapport sur la Croissière de l'“Almirante Lobo” en 1923.** [Report on the Cruise of the “Admiral Lobo” in 1923.] *Bull. Commission Internat. Exploration Sci. Mer. Méditerranée* 10: 19–20. 1924.

3362. CHOUARD, P. **Monographies phytosociologiques. I. La région de Brigueil l'ainé (Confolentais).** [Phytosociological monographs. I. The region of Brigueil l'Ainé (Confolentais, France).] *Bull. Soc. Bot. France* 72: 34–50. 1925.—Continuing a former paper (see *Bot. Absts.* 15, Entry 392) the author discusses an association of *Quercus sessiliflora* and *Teucrium scorodonia*. He then studies the following: (E) The scrub (Landes) with associations of *Ulex nanus*, with several facies, and associations of *Cicendia* on siliceous sands; (F) cultivated areas with associations of *Scleranthus annuus*, *Arnoseris minima* and (locally) *Radiola linoides* with crop and weed facies; (G) miscellaneous areas on walls and along hedges, etc., with associations such as those of *Hordeum murinum* and of *Sedum rubens*.—The author gives a table of the “genetic evolution” or succession of the associations studied. The tendency is always toward the oak forest (“chênaie”) which is the climatic climax association but the vegetation has in general reached only the intermediate scrub (“lande”). Geographically the area should be placed in the Atlantic Domain.—*J. Beauverie (translated)*.

3363. COHEN, JULIUS B., AND ARTHUR B. RUSTON. **Smoke: A study of town air.** *New ed.* xii + 108 p. 15 pl. Edward Arnold and Co.: London, 1925.—The influence of smoke on vegetation is among the topics discussed and there is a chapter on “The plant as an index of smoke pollution.”—*Geo. D. Fuller*.

3364. COHEN STUART, C. P. **Koolzuur-Bemesting.** [Carbon di-oxide fertilizing.] *Thee* 4: 115–117. 1923.—A review of literature, together with an unpublished statement from F. C. von Faber, that the air in the mountain rain forest at Tjibodas, West Java, contains no less than 0.05% of CO₂, as compared with 0.03% in the open in the same locality.—*Carl Hartley*.

3365. DANIEL, LUCIEN. **Recherches sur la flora d'Erquy et l'influence du climat marin sur la végétation.** [The flora of Erquy and the influence of the marine climate upon the vegetation.] *Rev. Bretonne Bot.* 1: 1–20. 1922.—Kircher, Linnaeus, Lamarck, DeCandolle and other early botanists reported that the flowers of certain Compositae and other plants opened and closed at certain definite periods, and that the precision of these movements was so pronounced that they might represent a kind of “floral clock.” The author, studying the dandelion and certain other plants throughout different seasons, finds no such precise movements. He says “the movements of flowers are due to variations in the turgescence of the plant as a whole and this turgescence naturally varies with the conditions of the external environment, particularly with meteorological conditions, both for the day of the opening and for the days that precede it.”—*P. D. Strausbaugh*.

3366. DANIEL, LUCIEN. **Sur les tiges dressées au stipes de quelques Fougères indigènes.** [The erect stems of some indigenous ferns.] *Rev. Bretonne Bot.* 1: 62–65. 4 fig. 1922.—Some erect stems of *Polystichum spinulosum* observed in Brittany grew to a height of 4 deci-

meters. Similar stems of *Athyrium Filix-foemina* were observed. The author regards these rather unusual stem-growths as responses to the mild temperature and constant humidity of this region.—P. D. Strausbaugh.

3367. DANIEL, LUCIEN. Sur les variations provoquées chez quelques plantes par les changements du niveau de l'eau au cours de leur végétation. [Variations induced in some plants by changes in the water level during the course of their development.] Rev. Bretonne Bot. 1: 21-31. 2 fig. 1922.—The author finds that certain aquatic plants, such as *Ranunculus nodiflorus*, *R. tripartitus*, and *Cardamine pratensis*, react to changes in the water level in such a way that very striking modifications of body-form and structure occur. Certain cases of such modifications prompted older botanists to describe and name 2 individuals of the same species as 2 distinct and separate species. In *Cardamine pratensis*, special reproductive buds are produced on the submerged parts, that preserve the plant under unfavorable conditions and also increase the number of individuals.—P. D. Strausbaugh.

3368. DANOIS, E. LE. Compte Rendu Sommaire des Croisières Françaises en Méditerranée pendant l'année 1924. [Summarized report on the French cruises in the Mediterranean during the year 1924.] Bull. Commission Internat. Exploration Sci. Mer. Méditerranée 10: 33-34. 1924.

3369. DARBISHIRE, O. V. Die Dünen der englischen Westküste gleich südlich von Southport (Grafschaft Lancashire). [Dunes of the west coast of England south of Southport, Lancashire.] Vegetationsbilder 16^{1,2}: 27 p. Pl. 1-12. fig. 1-2. 1924.—A general description of this dune area includes maps made in 1610 and in 1910. The species of the various associations are listed and a bibliography of 26 titles is appended. The plates illustrate various phases of dune formation with their accompanying vegetation, including associations characterized by *Psamma arenaria* R. u. S., *Agropyrum junceum* Beauv., *Euphorbia Paralias* L., *Carex arenaria* L. and *Salix repens* L.—Geo. D. Fuller.

3370. ERODIA, FILIPPO. Correlazione tra la produzione del frumento e l'andamento annuale delle piogge in Sicilia. [Correlation between the production of wheat and the annual rainfall in Sicily.] Atti R. Accad. Lincei Roma [Rendiconti Cl. Sci. Fis. Mat. e Nat.] 32²: 358-361. 1 fig. 1923.—A statistical study was made of the relation of rainfall to the yield of wheat in the provinces of Sicily from 1909 to 1923. It was found that the yield per ha. for these various years, expressed as a percentage of the average yield for the 15 years, was closely related to the total rainfall of the growing period in the computation of which, however, the rainfall of April and May is given double weight.—F. M. Blodgett.

3371. FABER, FRIEDRICH CARL VON. Untersuchungen über die Physiologie der javanischen Solfataren-Pflanzen. [The physiology of the Javanese solfatara-plants.] Flora 118-119: 89-110. 1925.—The association of the Javanese solfatara has a xerophytic component (*Eriaceae*) and a mesophytic component (*Rapanea avis*, *Ficus diversifolia*, *Melastoma setigera* et al.). The amount of transpiration and the anatomical structure of the plants do not justify the theory of physiological drought. The soil is characterized by high acidity, high temperature, low nitrogen and high aluminium content, with a wide range of moisture content. Most of the plants were found to contain large amounts of aluminium and they may be regarded as "aluminium plants." All the plants investigated were found to be root symbionts.—A. G. Stokey.

3372. GADECEAU, E. La forêt de Paimpont. [The forest of Paimpont.] Bull. Soc. Bot. France 72: 449-454. 1925.—This contains a botanical description of a fine forest of 7000 ha. situated in Ille-et-Villaine, France.—J. Beauverie (translated).

3373. GARDINER, J. STANLEY, editor. The natural history of Wicken Fen. Pt. 2. P. 65-171. Bowes & Bowes: Cambridge, 1925.—This part includes an account of some of the families of insects and observations on the H-ion concentration of the waters of the Fen.—Geo. D. Fuller.

3374. GAUME, R. Aperçu sur les groupements végétaux du plateau de Brie. [Plant communities of the plateau of Brie, France.] Bull. Soc. Bot. France 72: 393-416. 1925.—This plateau presents very uniform geological structure (pierre meulière) and fertile argilo-siliceous soil so extensively cultivated that the indigenous plant communities have been greatly modified. All the associations described consist of calcifuge plants. The asso-

ciations are briefly described, their principal species listed and the abundance and life form of the species indicated: (1) *Quercetum sessiliflorae*; (2) Mixed oak association (*Quercus sessiliflora* mixed with *Q. pedunculata*), (3) Beech association; (4) *Alnetum*; (5) *Ulex nanus* scrub; (6) *Erica cinerea* heath; (7) *Cicendietum*; (8) *Myriophylletum alterniflori*; (9) *Heleocharietum*; (10) *Agrostis canina* meadow; (11) *Droseretum rotundifoliae*; (12) *Sphagnetum*; (13) *Brachythecietum plumosi*; (14) *Cynoserotum cristati*; and (15) *Sceleranthetum annui*.—*J. Beauverie (translated)*.

3375. GIRAL, J. Rapport sur la matière organique. [Report on the organic matter.] Bull. Commission Internat. Exploration Sci. Mer Méditerranée 10: 48-49. 1924.

3376. GIRAL, J. Rapport sur l'utilité de pratiquer des déterminations de matière organique, oxygène et acide carbonique sur le même échantillon d'eau de mer. [Report on the practical utility of determinations of organic matter, oxygen and carbonic acid from the same sample of sea water.] Bull. Commission Internat. Exploration Sci. Mer. Méditerranée. 10: 46-47. 1924.

3377. GOODACRE, W. A. Are poppies poisonous to bees? Agric. Gaz. New South Wales 36: 746. 1925.—An experimental study of the Iceland poppy indicated that pollen from this plant causes no injury to honey bees.—*L. R. Waldron*.

3378. GUILLAUME, ANDRÉ. Les limites de végétation dans le nord et l'est de la France. [The limits of vegetation in the north and east of France.] La Géographie 40: 1-24. 3 maps. 1923.—As controlling plant distribution in the north and east of France, the author considers climatic factors most important, followed by lithological, physical and palaeological. He concludes that the same factors are not equally effective over all portions of the range of a species, that climatic factors are often effective only during a certain stage in the development of a plant and that the individuals of a species may be plentiful to the very limits of its range. Among the examples cited in support of his hypotheses are: (1) A considerable number of species reach the limits of their distribution in a zone extending north-west from the lower Loire to Ardennes. This seems dependent upon the heat required for the ripening of the seed of the plants and coincides with a line between the isotherms of the mean maximum and the monthly mean for the month of August. (2) A 2nd region of limitation of distribution is in a zone at right angles to the former and apparently determined by isotherms of late frosts during the spring. (3) A group of Atlantic species seem to have their limits determined by the number of rainy days during the growing season and the amplitude of the temperature variations during the spring and summer months.—*Geo. D. Fuller*.

3379. GUTTELING, W. M. Saliara en Kirinjoeh. [Lantana and Eupatorium.] Thee 6: 60-61. 1925.—Kirinjoeh, the Sundanese name of *Eupatorium pallescens*, means "termite plant." It forms a more luxuriant vegetation than *Lantana Camara*, is more valuable in preventing erosion, and chokes out the latter. When it is desired to crop the land which it has occupied, it can be more easily eradicated than *Lantana*. The succession, *Imperata cylindrica* to *Lantana* to *Eupatorium*, is noted as occurring on northerly slopes at 3000-4500 feet on young volcanic soil in west Java.—*Carl Hartley*.

3380. HANSON, HERBERT C. A study of the vegetation of northeastern Arizona. Univ. Nebraska Studies 24: 85-178. Pl. 1-9, fig. 1-16. 1924.—Six climax formations are included, ranging from the alpine meadow above 11,000 feet to the sagebrush desert below about 5,200 feet, the vegetation in relation to environment being studied particularly in the 4 lower formations. Dominant and secondary species are listed according to associations. Physiographic features, appearance of the vegetation, and intensity and duration aspects of environmental factors are discussed. The *Artemisia-Atriplex* (sagebrush) association (lowest) is characterized by the dominance of low, scattered shrubs with a sparse growth of herbs. The chief environmental factors are low precipitation, averaging about 7 inches annually, soil moisture seldom much above the hygroscopic coefficient, and high evaporation, averaging 54 cc. per day for 2 summers. The *Aristida-Bouteloua* (next higher) association is dominated by *Bouteloua eriopoda* forming a grassland composed of bunches or small mats a foot or more tall at maturity. The precipitation and soil moisture are a little greater than in the sagebrush. Daily evaporation averaged 47 cc. for 2 summers. The *Pinus-Juniperus* association, dominated by low, usually widely spaced trees of *Pinus edulis* and *Juniperus mono-*

sperma forms the next zone. The annual precipitation averages about 16 inches and soil moisture is available throughout the season in the 2nd foot and usually in the 1st. Daily evaporation for 2 seasons averaged 36.5 cc. The *Pinus-Pseudotsuga* association (6,800-8,300 feet) is dominated by large trees of *Pinus scopulorum*. In this consociation the precipitation averages 23 inches. Soil moisture is usually available the entire summer. The average evaporation for 2 seasons is 32 cc.—*Author*.

3381. HARSHBERGER, JOHN W. A banyan-like coppice of sour gum (*Nyssa sylvatica*). *Torreya* 25: 114. 2 fig. 1925.—The occurrence of a large tree of this species in Bucks County, Pennsylvania, surrounded by 187 smaller trees is recorded.—*Geo. D. Fuller*.

3382. HÄYRÉN, ERNST. Notiz über das Überwintern einiger Algen unter dem Eise. [The wintering of algae under ice.] *Meddel. Soc. Fauna Flora Fennica* 48: 174-177. 1924.—In a shallow gulf near the zoological station at Tvärminne, in South Finland, under ice 44-45 cm. thick, *Microcoleus clithronoplastes* was found actively vegetating during February and March. *Aphanotheca* spp., *Merismopedia glauca* and small bacteria were also growing well but *Beggiata* spp. were scarce. A 3rd group of weakly vegetating forms included *Lyngbya aestuarii*, *Tolypothrix tenuis*, *Rhizoclonium hieroglyphicum*, *Percusaria percursa*, and the Diatomaceae. A 4th group included vegetating fragments of *Ectocarpus* and *Stictyosiphon tortilis* and a 5th consisted of algal fragments so decomposed as to be unrecognizable.—*Author (translated)*.

3383. HÄYRÉN, ERNST. Om främmande kroppar i snö. [Foreign bodies in the snow.] *Terra* 34: 205-209. 1922.—In 9 samples of snow from southern Finland few inorganic, but many organic substances were found. There were carbon particles and living organisms of at least 17 genera, comprising 2 bacteria, 4 Chlorophyceae, 1 Saccharomyces, 6 Fungi Imperfecti, 1 lichen, 1 flagellate, and 1 rhizopod.—*Author (translated)*.

3384. HÄYRÉN, ERNST. Växtegeografiska anteckningar nedanför Jebrenjokk vid Torneträsk. [Phytogeographic observations below the Jebrenjokk River near Lake Torneträsk in Swedish Lapland.] *Terra* 36: 196-207. 5 fig. 1924.—The paper contains descriptions of (1) shore elevation and lagoon formation, (2) the character and (3) the development of the vegetation. On recently elevated areas are found mixtures of *Alnus incana*, *Betula tortuosa*, *Juniperus communis*, *Ribes glabellum*, *Salix nigricans*, *S. phylicifolia* and *Sorbus glabrata* in steadily increasing abundance until a dense grove is formed. Later on the groves become less dense, developing into a subalpine birch forest with undergrowth. In other cases the pioneers are mosses, grasses and herbs, succeeded by the shrubs and trees, leading to the same results.—In the water of the lagoons *Carex juncella* occurs in solid, large colonies which increase in number and as they become older are invaded by willows and various herbs and grasses. On the floor of the lagoons a cover of *Amblystegium* develops which gradually reaches the water surface. Then *Aulacomnium palustre* appears, followed by *Polytrichum* and higher plants ending in a *Salix* scrub.—Finally the author discusses the appearance of alpine species on the shores of subalpine lakes.—*Author (translated)*.

3385. HÄYRÉN, ERNST. Vegetationen på de förorenade stränderna i Helsingfors hamnområde. [The vegetation of the polluted portions of the shore waters in the vicinity of Helsingfors harbor.] *Havsforskningsinst. Skrift* 11²: 1-8. Helsingfors, 1922.—This contains a general survey and includes descriptions of the various associations and groups of saprobic species. Practical methods of determining the pollution of the waters by means of the shore vegetation are described.—*Author (translated)*.

3386. HOWARD, A. The effect of grass on trees. *Proc. Roy. Soc. London B* 97: 284-321. Pl. 14-19. 1925.—This problem has been under investigation at the Pusa Research Institute in India since 1914. The 2 main objectives have been (a) cause of grass injury to fruit trees (b) means by which forest trees eliminate grass. Grass and tree growth correspond in this region, except that the former is in abeyance during the hot season, March to May. The harmful effect of grass on fruit trees is intense. Newly planted fruit trees were found to form their superficial root system first of all, later forming the deeper system by means of which, after 2-3 years, they can weather the dry season without irrigation. Fruit trees under grass are able to form the deep root system, but scarcely the superficial. Grass is therefore distinctly less harmful to old than to young trees. Partial recovery from grass

injury was produced by aeration trenches in the case of loquat, mango, and litchi, but not in plums, limes, or custard apples. Guava survived under grass. The injurious effect in the foregoing cases was traced to an excess of CO_2 and a greatly diminished supply of combined N under the grass. Whether there was a suppression of nitrification or a high N consumption by grass is not known. Forest trees, on the other hand, have surface roots resistant to high CO_2 and able to reach the surface, competing there with grass for O_2 and minerals. In addition, their deeper roots, working down to 20 feet, enable them to continue growth during the dry season. Their growth form also gives them an advantage in the struggle for light and thus permits their eventual dominance.—*P. B. Sears.*

3387. JOLEAUD, L. Le régime des pluies et les zones de végétation de Maroc. [The rainfall regions and vegetation zones of Morocco.] *La Nature* 2692: 293-301. *Fig. 1-11.* 1925.—This is a semi-popular description of climatic and vegetational conditions in the moister portions of Morocco. The rainfall is periodic with 2 maxima in November and in March and light rainfall between these dates during the mild and pleasant winter. From April 15 to October 15 very little rain falls. A rainfall map gives the climatic and plant zonation, and the distribution of precipitation which ranges from 200 mm. or less to 500-800 mm. per annum. In the mountains above 2000 m. snow persists 6-9 months. This distribution of precipitation results in the following regions of vegetation: (1) Northern scrub forest developed in the Tangerian peninsula and characterized by Ericaceae and Cistaceae; (2) Central and eastern steppes, with 200-350 mm. of rain and a savana-like vegetation in which *Stipa* and other grasses dominate with open stands of *Zizyphus lotus*, *Acacia gummifera*, and *Pistacia atlantica*; (3) South-western forests of *Argania sideroxyylon*, with a rainfall of 300-400 mm.; (4) Atlantic dwarf palm steppe, where stands of *Chamaerops humilis* present aspects varying from open steppe where the rainfall is 300-400 mm. to a forest with a rainfall of 500 mm.; (5) Olive orchards of the Riff with 500-600 mm. of rain replacing a natural vegetation in which the genus *Olea* doubtless mingled with the dwarf palm and oak; (6) Oak and cedar forest of the Middle Atlas developing above 1000 m. with *Quercus lusitanica* and dominating up to 1700 m. and *Cedrus atlantica* to above 2000 m.; (7) Forests of the High Atlas, in which the chief trees are *Quercus ilex*, *Callitris articulata*, *Juniperus oxycedrus*, *J. phoenecia* and *J. thurifera*. All these formations are briefly but rather carefully described.—*Geo. D. Fuller.*

3388. JOUANNE, P. Essai de géographie botanique sur les forêts de l'Aisne. [A geobotanical discussion of the forests of Aisne.] *Bull. Soc. Bot. France* 72: 314-337. 4 *fig.* 1925.—A discussion of the plant associations of the vicinity of Laon, with particular attention to the forest of St. Gobain, France.—*J. Beauverie (translated).*

3389. KARSTEN, G. Das Licht im tropischen Regenwalde. [Light in the tropical rain forest.] *Vegetationsbilder* 16³: 9 p. *Pl. 13-18* 1925.—Emphasis is here placed on the fact that illumination is an important factor in the development of the tropical rain forest. Sunlight is intense in the tropics and reaches much of the vegetation due to the lack of uniformity in height of the taller elements in the forest and the form of the trees leaving intervals in the canopy through which the light enters. This light is reflected from the leaf surfaces and gives better illumination to the lower strata. The illustrations are of various foliage types that are efficient in light reflection and are from photographs made in Java and in Mexico. During cloudy weather illumination in the rain forest is poor.—*Geo. D. Fuller.*

3390. KARSTEN, GEORGE. Über mantelförmige Organe bei Epiphyten und Wurzelklettern. [Mantle organs of epiphytes and root climbers.] *Flora* 118-119: 300-311. 5 *fig.* 1925.—Certain species of epiphytes (*Conchophyllum maximum*, *Polypodium imbricatum*) which have mantle leaves protecting the roots are found in the Moluccas but not in Java. This is attributed to the difference in the distribution of the rainfall in the 2 regions. Abrupt changes in humidity are much more frequent in the Moluccas than in Java. In Mexico under comparable conditions there is a succulent epiphyte, *Cereus testudo*, whose roots are protected by the extension of the ribs of the stem. It is suggested that the habit of growth of the umbrella *Acacia* and the rosette habit, for example, *Plantago*, give a favorable amount of root protection.—*A. G. Stoekey.*

3391. KOPP, OTTO H. Ein Versuch zur Lösung des phänologischen Problems. [An attempt to solve the phenological problem.] *Forstwiss. Centralbl.* 47: 820-829, 866-875. 4 *fig.*

1925.—Calendar dates are of but little value because of variation in seasons. Phenological phenomena are governed principally by temperatures. Tables are given showing the average temperatures at which certain phenomena occur for a number of plants and animals. These are based on many thousands of observations made at 56 stations in Bavaria from 1869 to 1881, by working out the temperatures corresponding to the dates that were recorded.—*W. N. Sparhawk.*

3392. LAAN, E. VAN DER. *De bosschen van de Zuider- en Ooster-afdeeling van Borneo.* [The forests of the south-eastern presidency of Borneo.] (English summary.) *Tectona* 18: 925-952. 1 map. 1925.—The article gives a preliminary account of the rather unknown forests covering more than half of the south-eastern part of Borneo. Only 5% is non-forest. The moist, warm climate is very favorable for tropical mixed forests. Where the dry season is pronounced, a vegetation of grass and bullrushes and pure forests of *Melaleuca leucadendron* L. is easily developed. In the districts with much rain, however, the mixed forest re-establishes itself. The tree flora is very much complicated. At present about 500 species are known, of which number $\frac{1}{3}$ could be identified provisionally to the genera and $\frac{1}{3}$ to the species. In the tidal forests there are only a few species of trees to the ha.; in the lowland-forests, on the average, 12 species; and on dry land, about 18 species. The flora of the hills is unknown. Locally, ironwood (*Eusideroxylon Zwageri* T. and B.) occurs, with 30% of the cubic contents of the crop. The Dipterocarpaceae make up about 50% of the volume. The forests of direct economical value include only about 40% of the area.—*Ch. Coster.*

3393. LINKOLA, K. *Zur Kenntnis der Überwinterung der Unkräuter und Ruderalpflanzen in der Gegend von Helsingfors.* [The wintering of weeds and ruderal plants in the vicinity of Helsingfors.] *Ann. Soc. Zool. Bot. Fennicae Vanamo* 1: 91-228. 1922.—The observations were made on the winter habit at the end of the season and 133 species were shown to pass the winter as (1) seeds, (2) buds, (3) rosettes, (4) runners, and (5) in their summer condition. Separate chapters treat of the winter flora, the adaptations for wintering, the differences between winter annuals and summer annuals of the same species and the transitions from monocarpic ("Hapaxanthem") to polycarpic ("Pollakanthem") forms. Differences in the length of different winters gave differences in the wintering habits of *Stellaria media*, *Senecio vulgaris* and *Lamium purpureum*. They survived short winters but many died during longer winters.—*Author (translated).*

3394. L'ISLE, ROLLET DE. *Projet de carte bathymetrique de la Méditerranée.* [The project of a bathymetric chart of the Mediterranean.] *Bull. Commission Internat. Exploration Sci. Mer Méditerranée* 10: 52-53. 1924.

3395. LÜDI, WERNER. *Die Sukzession der Pflanzenvereine.* [The succession of plant communities.] *Mitt. der Naturf. Ges. Bern* 1919: 1-79. 1919.—In defining succession the author quotes Rübel: "a series of plant communities which, in a given spot, follow one another chronologically." A final state is attained in which, barring modification in general climatic conditions, there will be no further change. Relatively speaking, associations are the rest points in the process. In the pioneer stages the soil is rich in mineral salts and lacking in humus; thereafter humus increases and salts decrease. The most favorable relation between the two is in the medial stages. A typical succession may therefore be represented by a curve in which a quick climb to a maximum of luxuriance and production is followed by a more or less slow decline to the final community ("Schlussverein"). In the latter the soil is characterized by excess of humus and minimum of mineral salts, and the water supply to the vegetation is low whether or not the soil is actually dry. Therefore development normally begins with xerophytes or hydrophytes, attains a mesophytic maximum and closes with xerophytes. Forests are exceptional in that impoverishment of the soil is so slow that for practical purposes climax and final community are the same. Theoretically, however, forest will finally give way to heath. In a single, climatic region several final communities may occur, but there will be a single "chief final community" which will have the widest distribution.—*W. S. Cooper.*

3396. MAGRINI, M. G. *Relation sur l'activité Italienne.* [An account of the Italian activity.] *Bull. Commission Internat. Exploration Sci. Mer Méditerranée* 10: 35-45. 1924.—This describes investigations chiefly in the Strait of Messina and in the Dardanelles.—*T. C. Frye.*

3397. MANGIN, M. *Une mission forestière en Afrique occidentale française.* [A forestry mission in western French Africa.] *La Géographie* 42: 449-483, 629-654. *Map.* 1924.—The author recognizes and briefly describes regions of (1) thorn and grassland, (2) scrub forest, (3) forest, including dry forest, transition forest and tropical rain forest, (4) mountains and (5) coast areas. These are correlated to the classifications of Engler and of Shantz and Marbut. The chief economic species are listed and an estimate is made of the extent of each in Sudan, Senegal, Mauritania, Guinea, Ivory Coast and Dahomey. The causes, extent, and results of deforestation are considered and a provisional forest policy for the region is outlined.—*Geo. D. Fuller.*

3398. MARKGRAF, FR. *Die Bredower Forst.* [The Bredower Forest (near Berlin).] (Abstract.) *Verhand. Bot. Vereins Brandenburg* 65: 20-26. 1923.—A review of the relation of the general soil conditions to the plant associations and growth forms.—*H. L. Blomquist.*

3399. MURPHY, ROBERT CUSHMAN. *The romance of science in Polynesia.* *Nation. Geog. Mag.* 48: 355-426. 69 *illus.* (16 *col.*) 1925.—This elaborately illustrated description of the islands, contains a discussion of native economic plants.—*W. M. Atwood.*

3400. NORDHAGEN, ROLF. *Om nomenklatur og begrepsdannelse i plantesociologien.* [Nomenclature and framing of concepts in plant sociology.] *Nyt. Mag. Naturw.* 57: 2-128. 1919.—A distinction is made between "plant sociology" and "synecology," the former being the science of plant communities as a whole, the latter dealing with the strictly "ecological" aspects. In determining the nature of the basic plant-sociological unit, only uniform, homogeneous plant communities may be taken into consideration. In closed vegetation the unit must possess floristic uniformity and also quantitative uniformity expressed by uniform degree of covering and a constant relation between the degree of covering for each species and the total. In open vegetation only qualitative uniformity is demanded. To designate the fundamental unit either "stand" (Bestand) or "association" may be used. If "stand" be adopted, the correct general term to express similarity of numerous stands is "stand-type" ("Bestandestypus"). If "association" be preferred, "association-type" must be used. It is not logical to use "association" to express similarity between a number of "stands." Association-types which are similar in physiognomic aspect are referred to the same "formation." The author accepts the "association-complex" as proposed by Du Rietz—any union in nature of several associations to form a phytogeographic unit.—*W. S. Cooper.*

3401. OSMASTON, A. E. *The forests of the Tehri Garhwal.* [Rev. of: W. DUDGEON AND L. A. KENOYER. *The ecology of Tehri Garhwal; a contribution to the ecology of the Western Himalaya.* *Jour. Indian Bot. Soc.* *Illus.* April, 1925.] *Indian Forest.* 51: 528-533. 1925.—The author's opinion that forests of *Pinus longifolia* and *Cedrus deodara* are edaphic climax is believed to be wrong, as the types, if not a climatic climax, should be regarded as caused by fire on the basis of the comparative immunity of the species to fire damage. Fire is likely to produce dry soils and dry soils to encourage fire. It is agreed that the influence of man has prevented forest from reclaiming the poorer soils and that natural recovery is prevented when the original climax vegetation has been destroyed.—*E. N. Munns.*

3402. PEMBERTON, C. C. *Field studies of growth forms of some of the native trees of the environment of Victoria.* B. C. Twining firs. *Canadian Field Naturalist* 39: 131-137. *Fig.* 1-7. 1925.—A record is here made of small individuals of *Abies grandis* twining about larger trees. *Pseudotsuga* is also shown to occasionally behave in the same manner. The reasons for this type of behavior are obscure.—*Geo. D. Fuller.*

3403. PILÁT, A. *Alpine region der Westkarpathen.* [The alpine region of the Western Carpathians.] *Vegetationsbilder* 164: 14 p. *Pl.* 19-24. 1925.—Descriptions with lists of species are given for the alpine scrub and upper alpine plant communities. The plates illustrate the wind timber ("Knieholzregion") and associations characterized by *Bellidiastrum Micheli* Cass., *Sempervivum montanum* L., *Saxifraga perdurans* Kit., *Androsace lactea* L., *Rhodiola rosea* L., *Carex firma* Host., *Veronica aphylla* L., *Astragalus alpinus* L., *Leontopodium alpinum* Cass. and *Salix reticulata* L.—*Geo. D. Fuller.*

3404. POOLE, H. H. *On the photo-electric measurement of submarine illumination.* *Notes. Bot. School Trinity Coll. Dublin* 3: 303-319. 1925.—A method is described of using photo-electric cells for submarine photometry which may be employed in a comparatively small vessel at sea in fine weather.—*Geo. B. Rigg.*

3405. ROIVANINEN, H. Tietoja kasvillisuudesta sekä putkilo-ja lehtisammalkasvistosta keskisen Luttojoen seuduilla Suomen Lapissa. [The vegetation, including the vascular and moss plants, of the river Luttojoki, in Finish Lapland.] (German summary.) Ann. Soc. Zool. Bot. Fennica Vanamo 1: 229-304. 1923.—This gives a description of the vegetation and flora of a very uniform, almost uninhabited area of 45 sq. miles in Finish Lapland. An annotated list of 236 vascular plants and 104 mosses is given.—*K. Linkola (translated)*.

3406. STOCKER, O. Beiträge zum Halophytenproblem II. Standort und Transpiration der Nordsee-Halophyten. [The halophyte problem. II. North Sea habitats and transpiration.] Zeitschr. Bot. 17: 1-24. 1925.—Plants of the North Sea coastal shallows are true halophytes, the salt content of the substratum running up to 6% of the soil solution. Neither their anatomy nor transpiration suggest xerophytism but rather meso- or hygrophytism. Factors chiefly influencing the vegetation are (a) soil peculiarities and (b) salt content. The soil is subject to movement on a large scale. Some plants meet this by massive underground development—a factor not leading to insufficient absorption. Others do so by being annual in nature with a growing season which misses the catastrophic changes of winter. Variations in salt content of soil and osmotic pressure of plants are discussed. The key to the halophytic problem is held definitely to lie apart from Schimper's xerophyte theory, and doubtless to be connected with a peculiar relation to salt. Further investigation is considered essential.—*P. B. Sears*.

3407. SWARBRICK, THOMAS. The grasslands of Yorkshire coal measure and limestone soils. Naturalist 1925: 207-213. 1925.—An analysis of vegetation was carried out at Parlington Park, near Leeds, where the northern edge of the Yorkshire coal field meets the outcrop of the magnesian limestone, on land that had not been disturbed in any way within living memory. Mechanical analyses of the 2 soils were alike. Soil acidity seemed not entirely due to H-ion concentration, a pH value of 6.7 with lime requirement of 23 hundredweight per acre in one case contrasting with pH 7.3 and negative lime requirement in the other. A mat of decaying vegetable matter 2-4 inches thick beneath the living carpet (absent from limestone soil) influenced the water supply. Analyses of the herbage indicated that both areas were dominated by grasses of very little crop or food value. An application of basic slag improved the white clover but had no effect on the grasses.—*W. H. Burrell*.

3408. THODAY, D. The geographic distribution and ecology of *Passerina*. Ann. Botany 39: 175-208. 4 fig. 1925.—*Passerina* is endemic in South Africa. The distribution indicates that each species of the genus is specialized for a definite environmental range, those with strongest morphological claim to antiquity being restricted; those appearing to be derivative having the widest range. The concentration of species points to the south as the center of origin. The endemism of the Cape flora is correlated with the peculiar climatic conditions. Confinement by specialization and protection from wholesale invasion have been important in preserving the endemic character of the flora.—*W. P. Thompson*.

3409. WARD, F. KINGDON. Sino-Himalaya. Nature 116: 282-284. 1925.—In this general description of some of the geographical features of the region it is stated that the Assam-Himalaya shows a very close floristic affinity with the Yunnan ranges from which it is separated by deep river gorges. The distribution of the genera, *Rhododendron*, *Primula* and *Meconopsis* are cited in support of this thesis.—*Geo. D. Fuller*.

3410. WILD, BERNHARD. Schlagform und Standortsflora im Jura. [Cutting method and surface vegetation in the Jura.] Forstwiss. Centralbl. 47: 813-819. 1925.—The effect of group selection and of shelterwood cutting was studied in the same mixed stand of pine, spruce, fir, and beech in which Wrede conducted meteorological investigations. At the end of the 2nd season after cutting, the number of species had doubled in the small openings resulting from group cutting, and had tripled under the shelterwood stand. In the uncut stand, mosses (*Hypnum* spp.) predominated; in the openings several other mosses and scattered phanerogams appeared; while under shelterwood there were fewer mosses and a considerable increase in sedges and herbaceous plants. It is concluded that the floristic composition of a plant association, rather than the presence or absence of single species, should be used as an index of site quality.—*W. N. Sparhawk*.

3411. WISHERD, EDWIN L., AND JACOB GAYER. Canyons and cacti of the American southwest. *Nation. Geog. Mag.* 48: 275-290. 22 col. illus. 1925.—Reproductions in color accompany a general description of the region.—*W. M. Atwood.*

STRUCTURE, BEHAVIOR, SYMBIOSIS

3412. BURKILL, I. H. Insect vision in connection with flower fertilization. *Singapore Nat.* 5: 23-46. 1925.—A summary of recent work on this subject.—*R. E. Holttum.*

3413. DOCTERS VAN LEEUWEN, W. M. Kleiner Beitrag zur Kenntnis der endozoischen Verbreitung einiger Hochgebirgspflanzen auf Java. [Endozoic distribution of some plants of high mountains of Java.] *Flora* 118-119: 81-88. 1925.—A study of the feeding habits of certain birds and small mammals together with an investigation of the seed found in the stomach and intestines indicate that these animals are important agents of distribution of certain plants such as *Gaultheria* spp., *Vaccinium* spp., *Myrica japonica*, *Rapanea avenis*.—*Anna M. Starr.*

3414. DUBOIS, RAPHAEL. Sur les plantes vertes sans racines et la culture par symbiose. [Green plants without roots and symbiotic culture.] *Compt. Rend. Soc. Biol.* 92: 1487-1489. 1925.—For such plants as *Tillandsia* and many orchids which grow on rocks and similar places where there is no soil, the term "anagrote" ("a", without, plus "agros," tillable land) is proposed.—Experiments are reported with *Sonchus oleraceus* L. which was grown on the fungus *Stereum hirsutum* Persoon. The milk of the thistle supplied the fungus with carbohydrates while the fungus provided the thistle with nitrogen and mineral salts. The thistle did not produce roots but a spongy protuberance which replaced the roots. It lived to complete its development and produce seed.—*Oran Raber.*

3415. GATER, B. A. R. Insects on African oil palms. *Malayan Agric. Jour.* 13: 250-256. 1925.—Though dealing mainly with pests of *Elaeis guineensis*, the paper records observations on insects caught visiting this palm, in connection with the question of pollination. Of 1426 insects (chiefly Apidae), only 4.5% visited female flowers, and proof that they effect pollination is lacking.—*R. E. Holttum.*

3416. KIRCHNER, O. VON. Über die sogenannten Pollenblumen und die Ausbeutestoffe der Blüten. [The so-called pollen-flowers and the profitable substances of the flowers.] *Flora* 118-119: 312-330. 1925.—Müller's classification of flowers is criticised in regard to the emphasis laid on the presence or absence of nectar. Distinction should be made between flowers which are regularly self-pollinated and the various types of pollenflowers.—*A. G. Stokey.*

3417. MENZEL, R. In "thread blight" levende muggen. [Midges living in thread blight.] *Thee* 4: 86-87. Illus. 1923.—Symbiosis is noted in Java and Sumatra between *Corticium* and a midge.—*Carl Hartley.*

3418. PATCH, EDITH M. The primary foodplant of the melon aphid. *Science* 62: 510. 1925.—*Aphis gossypii* uses a variety of plants of economic importance for its summer food. It has been found to over-winter on *Sedum Telephium*.—*C. J. Lyon.*

3419. PEYRONEL, B. Specie di Endogone produttrici di micorrize endotrofiche. [A species of Endogone producing an endotropic mycorrhiza.] *Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. Roma* 5: 72-75. 1924.—In this preliminary note the author indicates that 3 species of *Endogone* may be involved in the mycorrhiza of herbaceous phanerogams. One species is characteristic of peaty, swampy soils and was found upon the roots of *Viola palustris* alone, although it is probably able to live upon other phanerogams adapted to mossy swamps. A 2nd species, exclusively hydrophilous, was, however, found upon *Viola palustris*, *Peucedanum Ostruthium*, and *P. verticillatum*; the last is perhaps related to *Endogone macrocarpa*. The 3rd species was found on *Euphorbia dulcis*, and might belong to the group of *Endogone lactiflua*.—*R. Ciferri (translated).*

3420. QADIR, S. A. Santalum album in the Chittoor District of Madras Presidency. *Indian Forest* 51: 502-504. 1925.—Evidence indicates that root-parasitism is necessary. Trees lived 5 years in a pure stand, but were unable to survive, though all individuals were parasitic upon each other. Plants raised on trenched islands separated from other plants uniformly died and similarly raised plants, although apparently dying, recovered and flourished when other plants were transplanted among them.—*E. N. Munns.*

3421. RESVOLL, THEKLA R. Beschuppte Laubknospen in den immerfeuchten Tropenwäldern Javas. [Buds with scales in the tropical rain-forests of Java.] *Flora* 118-119: 409-420. 6 fig. 1925.—Five species of *Quercus*, of which 4 are endemic to Java and all are members of the rain-forest, were found to have resting buds furnished with scales comparable in every way with those of winter buds of *Q. robur* growing in Norway. The development of these buds is attributed to internal factors common to the genus whose center of distribution is in the temperate regions.—*Anna M. Starr.*

3422. STÄGER, R. Bedeutung der Ameise in der Pflanzengeographie. [The role of ants in phytogeography.] *Mitt. Naturf. Ges. Bern* 1924: 51-75. 6 fig. 1924.—The author regards the influence of ants in the dissemination of seed plants as usually underestimated. Even above the timber line *Thaspium alpinum* is found about ant hills where the seed have been carried by these insects. In these alpine regions the deeper soil and more abundant humus, resulting from the nests of *Formica pratensis*, are often indicated by luxuriant clumps of *Epilobium angustifolium*. Here, in the absence of earthworms, ants modify the texture of dry, sunny soil such as morainic gravel and river sand. *Formica fusca* by their mining action cause the sinking of stones below the surface in alpine regions, as well as the covering of rocky areas with fine soil. Flat pastures are also made irregular by similar action. Not only is there a loosening of soil by the action of ants but there is also an increase of nitrogen and of humus due to the same agency.—*Geo. D. Fuller.*

3423. THOMPSON, H. STUART. Flowering plants as epiphytes on willows and alders. *Nature* 116: 710-711. 1925.—The writer has observed 104 species of vascular plants growing upon tree trunks along the river Chew [England]. About half the species are mentioned. A dozen woody plants are included, umbellifers are well represented, but few monocotyledons and no legumes.—*O. A. Stevens.*

3424. VAINIO, ED. A. Mycosymbiose. Symbiose de deux champignons. [Symbiosis of two fungi.] *Ann. Soc. Zool.-Bot. Fennicae Vanoma* 1: 56-60. 1921.—Under or in the thallus of the Discomycete, *Diplothrix mirabilis* Vain. n. sp., which grows in the Philippines on the foliage of trees, is always found the Pyrenomycete, *Gonidionyces sociabilis* Vain. n. sp. The latter may grow independently, but the former always requires a fungus symbiont. The apical cells and the young hyphal branches of *Gonidionyces* get their food from the base of the apothecium of *Diplothrix* without inhibiting the natural development of the apothecium.—*K. Linkola (translated).*

FLORISTICS

3425. BURKILL, I. H., AND M. R. HENDERSON. The flowering plants of Taiping, in the Malay Peninsula. *Gard. Bull. Straits Settlements* 3: 303-458. 1925.—This is a list of all the flowering plants known to occur in the neighbourhood of Taiping, in Perak, with details of their distribution within and without the Malay Peninsula; 1980 species are enumerated, of which 34% are trees, 22% climbers, 19% shrubs, 18% herbs, 10% epiphytes, and 1% parasites; 819 are endemic to the Malay Peninsula south of 7°N. lat. An introduction to the paper contains a topographical description of the area, climatic statistics, a description of various types of vegetation concerned, and an elaborate analysis of the distribution of the flora, especially of the endemic species.—*R. E. Holttum.*

3426. BURNHAM, STEWART H., AND ROY A. LATHAM. The flora of the town of Southold, Long Island and Gardiner's Island, New York. Third supplementary list. *Torreyia* 23: 3-9, 25-31, 1923. Fourth supplementary list. *Ibid.* 24: 22-32. 1924. Fifth supplementary list. *Ibid.* 25: 71-83. 1925.

3427. CHOUARD, PIERRE. Note préliminaire sur la flore du massif de Néouvielle (Haute-Pyrénées). [The flora of Neouvielle, High Pyrenees.] *Bull. Soc. Bot. France* 72: 337-341. 1925.—In making a phytosociological study of this mountainous region the author now reports on certain floristic features, citing among the species new for the "massif," *Anemone narcissiflora* L. var. *monanthos* DC., *Drosera rotundiflora* L. (at 2,200 m.), *Erica tetralix* L. (at 2,200 m.), and *Thymus lanuginosa* Mill. Among those new for the Pyrenees are *Erysimum pelveticum* DC., *Tilia intermedia* DC., *Rosa pervirens* Gren., and *Alnus incana* Willd. He also cites species known to local botanists, that have not found their way into literature, such as the presence of *Erythronium Dens-leonis* L. at 2,200 m.—*L. Foucheron (translated).*

3428. COCKS, R. S. Catalogue of trees growing naturally in the vicinity of Sardis, Dallas County, Alabama. Jour. Arnold Arboretum 6: 189-195. 1925.—An enumeration of 130 species of trees observed near Sardis and all with the exception of 5 or 6 growing on a small strip of land comprising about 300 acres and extending along the Alabama River for a distance of about $\frac{3}{4}$ mile.—*Alfred Rehder*.

3429. CONILL, L. Le *Bulbocastanum incrassatum* Lange dans les Pyrénées orientales. [*B. incrassatum* in the eastern Pyrenees.] Bull. Soc. Bot. France 72: 27-28. 1925.—The author cites the presence of this umbellifer in several localities of the eastern Pyrenees and accounts for its distribution by the seed being carried in the manure applied to the vineyards.—*R. Douin (translated)*.

3430. DE WILDEMAN, E. Considérations sur l'état actuel des connaissances relatives a la géo-botanique du Congo belge. [The present state of our knowledge of the geobotany of the Belgian Congo.] Congo [Bruxelles]. 43 p. 8 pl., 1 map. (May-June.) 1925.—The author reviews the various aspects of the flora of the Congo indicating the increase of knowledge since the appearance, in 1909, of the "Sylloge florae Congolanae." He notes 7 districts belonging to the Guinean Forest Province and 3 belonging to the Southern and Eastern Steppe Province. He insists that the extent of the tropical forest is rapidly diminishing on account of the invasion of native and introduced agriculture and that there is urgent need of a scientific investigation of the rich plant resources of the region.—*Author (translated)*.

3431. FERGUSON, WILLIAM C. Ferns and flowering plants of the Hamstead Plains, Long Island, New York [U. S. A.]. Torreyia 25: 109-113. 1925.—The area is mostly dry open prairie with 2 swampy areas and some acres of *Pinus rigida*. The species found in the prairie, in the swamps and in the pine forest are indicated.—*Geo. D. Fuller*.

3432. FRIES, HARALD. Bidrag till kännedomen om floran i Göteborgs och Bohus län. [The flora of the province of Göteborg and Bohus.] Acta Hort. Gothoburg. 1: 197-206. 1924.—A long list of flowering plants and ferns is given, most of them rather uncommon in west Sweden and here recorded for new localities.—*C. Skottsberg*.

3433. FRISENDARL, ARVID. Om *Lathyrus sphaericus* Retz. i Norden. [*L. sphaericus* Retz. in Scandinavia.] Acta Hort. Gothoburg. 1: 241-252. 4 fig. 1924.—*Lathyrus sphaericus* has long been known from 3 localities in Scandinavia, the islands of Fyen and Bornholm in Denmark and the Kullaberg ridge in Skåne, Sweden. In 1921 it was discovered on a small rocky islet on the coast of Bohuslän, much further north. It is not a recent arrival here but has escaped notice owing to the nature of the locality, a narrow shelf on a steep cliff wall. This appears to be a relict locality from a greater distribution during the warmer, sub-boreal postglacial period.—*C. Skottsberg*.

3434. GANDARA, GUILLERMO. Otro modo de estimar la flora del Valle de México. [Another way of evaluating the flora of the Valley of Mexico.] México Forest. 3: 157-162. 1925.—The writer lists 108 families of phanerogams, comprising 1319 species; there are 293 species of cryptogams, not listed. Lists are given of the more important genera or species on typical sites.—*W. N. Sparhawk*.

3435. GANDOGER, M. La flore des îles Kerguelen (Amérique australe). [Flora of the Kerguelen Islands.] Bull. Soc. Bot. France 72: 177-180. 1925.—These islands abound in endemics. The author was able to study a portion of the collections made by Pean in 1923-1924. He gives notes on certain notable species already described by Hooker and describes as a new species *Azorella antipoda*.—*J. Beauverie (translated)*.

3436. GRIER, N. M. Unreported plants from Long Island. 1. Pteridophyta and Spermatophyta. Torreyia 24: 71-76. 1924.—A list of previously unreported plants from the vicinity of Cold Spring Harbor. A rather complete bibliography is included.—*Wm. G. McGinnies*.

3437. GROH, HERBERT. *Stachys germanica* in Canada. Canadian Field Nat. 39: 84-85. 1925.—A 2nd colony of this plant in Canada is recorded. In each location it has shown itself capable of becoming an aggressive weed.—*Author*.

3438. HENDERSON, M. R. A note on the Flora of Cameron's Highlands. Singapore Nat. 5: 91-92. 1925.—In this upland valley are found certain genera of plants (*Viola*, *Sanicula*, *Lonicera*, *Disporum*) which are otherwise absent from the Malay Peninsula, but occur on

the Himalayas and in Sumatra and Java. The conditions of growth and origins of these plants are briefly discussed.—*R. E. Holtum*.

3439. HIDÉN, I. *Polygonum alpinum* All. Turun seudulla. [*P. alpinum* All. in the Abo region.] Meddel. Soc. Fauna et Flora Fennica 50: 29-30. 1925.—This species was found at the foot of a mountain in southwestern Finland. It was possibly introduced.—*K. Linkola (translated)*.

3440. HIDÉN, I. Tietoja Sakkulan pitäjän kasvistosta. [The flora of the parish of Sakula.] Meddel. Soc. Fauna et Flora Fennica 49: 124-131. 1925.—Mostly floristic notes on a region in southern Finland.—*K. Linkola (translated)*.

3441. HOLTUM, R. E. Notes on the flora of Pualu Jong. Singapore Nat. 5: 47-50. 1925.—A short account of the vegetation of a small islet near Singapore is given. No large species occur, except by the shore, and no shade plants; only 41 species of vascular plants were noted.—*Author*.

3442. KELLY, WM. H. Northern records of the strawberry in the Mackenzie River Basin. Canadian Field Nat. 38: 180. 1924.—The most northerly records for *Fragaria virginiana* are on a western tributary of the Mackenzie at about 64°N. and on the west shore of Great Slave Lake.—*H. Groh*.

3443. KNOWLTON, C. H., C. A. WEATHERBY, AND W. S. RIPLEY. Fourth report of the committee on floral areas. Rhodora 27: 56-65. 1925.—The report begins with a list of New England Compositae (from *Vernonia* though *Solidago*) in which the occurrence of each species and important variety in each of the New England States is recorded. The species are then divided into 12 groups according to range, with notes on the localities of the rarer species and on peculiarities of distribution.—*S. F. Blake*.

3444. MOUSLEY, HENRY. Further notes on the orchids of Hatley, Stanstead County, Quebec. Canadian Field Nat. 38: 61-63, 86-88. 1924.—Five additional species and varieties are listed. Field observations on certain species modify current descriptions, as, for example, differences in stem measurements.—*H. Groh*.

3445. OHLSEN, RAGNAR. Bidrag till kännedomen om kärlväxtfloran i södra Inland, Bohuslän. [The vascular flora of south Inland, Bohuslän.] Acta Hort. Gothoburg. 1: 207-210. 1924.—A short sketch of the vegetation and a list of noteworthy species are given.—*C. Skottsberg*.

3446. REILLY, B. J. The flora of Cyprus. Cyprus Agric. Jour. 20: 86-88. 1925.—The climatic and geological conditions are regarded by geologists as responsible for the geographical distribution of plants in Cyprus. Three fairly distinctive plant zones are found—low lying, middle, and upper mountainous. In addition to affecting distribution, local factors influence the structure of the plants. Lack of rainfall has caused most of them to become xerophytes. The most prolific species in Cyprus usually have the least economic value.—*W. Stuart*.

3447. RIDLEY, H. N. Endemic plants. Jour. Bot. 63: 182-183. 1925.—It is proposed that plants that are the relics of a lost flora be termed "epibiotics" to distinguish them from species of limited distribution which have failed to spread or which grow near allied species. For this latter class the term "endemic" is retained.—*Geo. D. Fuller*.

3448. RUPP, H. M. R. On the orchids of the Bulladelah district of New South Wales. Australian Nat. 5: 217-228. 1925.—This contains general notes, items of popular interest, local habitats, variations, and popular names. There is a list of 87 species falling into 6 genera restricted to trees or rocks or both, and to 22 terrestrial genera.—*T. C. Frye*.

3449. SENNEN, LE FRÈRE. La garrigue du littoral, depuis Montpellier jusqu'à Sagunto. [The garrigue vegetation of the shores from Montpellier to Sagunto.] Bull. Soc. Bot. France 72: 92-114. 1925.—The regions studied consist of the fertile plains formed by the alluvial deposits of numerous streams as they enter the Mediterranean. The species encountered are listed with brief comment. The species of the marshes, with the exception of some grasses, do not belong to the garrigue. The plant population here listed contains 352 dicotyledons, 57 monocotyledons, 3 conifers and 5 cryptogams.—*Henri des Gayets (translated)*.

3450. SKOTTSBERG, C. Juan Fernandez and Hawaii. A phytogeographical discussion. Bernice P. Bishop Museum Bull. 16. 1-47. 1925.—Juan Fernandez and Hawaii are groups

of volcanic islands, very remote from each other but with common features in their flora. It is hardly probable that vegetation has originated on the islands after they had assumed their present shape; they are young islands and the flora contains many isolated types where isolation seems the result of considerable age and of geographical changes. Nor is it likely that the high endemism has resulted from an extermination, in all other countries, of all identical species of close ancestors. There is much evidence in favor of a continental origin for the Juan Fernandez flora, that it existed long before the present islands were formed and gradually took possession of them during the submergence of their old home. Part of this flora was derived from the Antarctic continent by way of South America, thus explaining the affinities with New Zealand or Polynesia. This circuit is preferred to the direct land bridges of other authors. Even Hawaii contains old-Pacific and Antarctic types, of which the original home ought to lie in the south, but the road across Polynesia to Hawaii is more difficult to trace. A better knowledge of the bathymetrical and general oceanographic features is greatly needed, as well as a critical revision of the floras. The author is confident that future investigations will show that the history of the Hawaiian flora is, in its principles, similar to that of Juan Fernandez. The disappearance of the Tertiary Antarctic flora during the Ice Age is of fundamental importance and has been greatly underrated by plant-geographers. No catastrophe of such dimensions and of such consequences has ever befallen the Tertiary flora of the Northern Hemisphere.—*Author's Summary.*

3451. SKOTTSBERG, C. Zur Gefässpflanzenflora Westpatagoniens. [The vascular flora of Western Patagonia.] Kungl. Vetenskaps Vitterhets-Samhälles Handlingar [Göteborg] Fjärde Följden 28: 1-29. 7 fig. 1924.—The author classified a collection of phanerogams (90 spp.) and ferns (11 spp.) made during the visit of O. Nordenskjöld in 1920-1921 to Kelly Inlet and the vicinity of the San Tadeo glacier, a section of West Patagonia little visited by naturalists. On some species critical notes are added. *Scirpus atrosanguineus* n. comb. (*Dichromena atrosanguinea* Desv.), formerly identified with *S. americanus* Pers., *S. chilensis* Nees or even with *S. riparius* Presl, is shown to be distinct from all of these. The little known *Viola Commersonii* DC. is discussed and figured, and a hint is given for distinguishing *Myrtus luma* Barn. and *Myrceugenia apiculata* Ndz. (often mistaken for each other when sterile) on anatomical leaf characters. The systematic value of the forms of *Anagallis alternifolia* Cav. is elucidated on ample material, the most austral variety retaining the name var. *densifolia* Hook. fil. The most interesting discovery was that of *Euphrasia perpusilla* R. A. Phil., of which only the type material from the Chonos islands was known before. The author examined the type for comparison and publishes a description, with figures. Guided by his own experience from nearly the same region and by notes taken by Nordenskjöld the author tried to compile a short sketch of the vegetation. The forest of the Taitao peninsula belongs to the southern type of Valdivian rain forest, with *Nothofagus nitida* as the prevailing tree. In Kelly Inlet *N. betuloides* becomes associated, and further inland this is the commonest species. The bog forest is, as usual, characterized by *Libocedrus tetragona*, and the less swampy type of ground by the deciduous beech *Nothofagus antarctica*. This species and the evergreen *N. betuloides* form the timber line, about 600-700 m., on the mountains separating Kelly Inlet from the San Tadeo glacier to the north. The alpine region shows a widespread community of cushion plants which reappear in the coastal swamps. The rain forest advances very close to the glaciers. Barren moraine plains seem to have the same flora as farther south, forming colonies of vegetation.—*C. Skottsberg.*

3452. SMITH, JESSE F. Late-blooming violets in Connecticut. *Rhodora* 27: 51. 1925. *Viola scabruiscula* was found in flower on October 25, and *V. pedata* on November 2 and 15.—*S. F. Blake.*

3453. STERNER, RIKARD. The continental element in the flora of South Sweden. *Geografiska Annaler* 1922: 221-444. Pl. 3-22, fig. 1-27. 1922.—From data obtained from published works, from manuscripts, from the examination of herbaria and from travel, the author has made an exhaustive analysis of the flora of South Sweden. The continental element is considered to comprise those species which have a wide distribution in eastern Europe, reaching their western limits at or near the Atlantic coast. Of these, 115 are recognized in South Sweden, forming 12% of the flora. A detailed distribution of each is given and the

ecological group to which it belongs is discussed. Floristically they are chiefly from the following classes: (1) Meridional, mainly found in the steppe regions; (2) Meridio-Boreal, from both steppe and forest regions; (3) Boreal, mainly from the oak forest region; and (4) Siberian. Subdivisions of these classes are recognized and discussed. The conclusion is reached that the eastern part of the region studied, including Öland and Gotland, belongs in the eastern province (Sarmatia) of Engler's Baltic Region and the western part comes into the western province (Subatlantis) of the same Region.—Among other topics discussed are the climate, soil, ecology and geographical conditions of South Sweden and the general history of the flora. Not less than 75 maps of distribution are given and the bibliography comprises some 220 titles.—*Geo. D. Fuller.*

3454. SVENSON, H. K. The white pine in middle Tennessee. *Rhodora* 25: 27-28. 1925.—Note on the occurrence of *Pinus Strobus* in Cheatham Co., Tennessee, a southward extension of the known range.—*S. F. Blake.*

3455. WALL, A. The flora of Mount Cook. 55 p. *Illus.* The Lytellton Times Co.: Christchurch, New Zealand, 1925.—This is a guide to the flora of Mount Cook and vicinity, arranged as a series of excursions, with notes on the plant-communities and growth-forms. There is also a catalogue of the species of flowering plants and ferns.—*H. H. Allan.*

3456. WALL, A. The Riccarton bush. 13 p. The Lytellton Times Co.: Christchurch, New Zealand. [1923].—This gives an account of the plants occurring in a forest-remnant, near the city of Christchurch, now the property of the city. A description of the chief growth-forms is followed by a list of the species present.—*H. H. Allan.*

3457. ZAMELS, A. Place phylogénétique et extension géographique de *Pulsatilla nigricans* Störck. [Phylogeny and geographic distribution of *P. nigricans*.] *Compt. Rend. Soc. Biol.* 92: 881-884. 2 fig. 1925.—This species stands phylogenetically between *P. montana* and *P. pratensis*. *P. zichyi* is a development from it.—*P. nigricans* is found in southwestern Denmark, central Germany, Bohemia, Austria, and Hungary.—*Oran Raber.*

FOREST BOTANY AND FORESTRY

W. N. SPARHAWK, *Editor*

(See also in this issue Entries 3062, 3036, 3091, 3101, 3263, 3264, 3274, 3276, 3280, 3299, 3302, 3303, 3309, 3353, 3359, 3362, 3363, 3372, 3374, 3380, 3381, 3384, 3386, 3387, 3388, 3389, 3391, 3392, 3395, 3397, 3398, 3399, 3401, 3402, 3410, 3420, 3423, 3451, 3454, 3456, 3567, 3672, 3691, 3724, 3725, 3726, 3727, 3728, 3729, 3730, 3737, 3801, 3802, 3803, 3819, 3863, 3866, 3868, 3870, 3905, 3906, 3907, 3908, 3912, 3913, 3926, 3945, 3948, 3961, 3962, 3969, 3970, 3971, 3973, 3980, 4005, 4115, 4137, 4161, 4199, 4228, 4255, 4404, 4411, 4412, 4416, 4417)

3458. ANONYMOUS. Private reforestation begins in Douglas fir region. *Timberman* 27²: 49. 4 fig. 1925.—A paper company owning 125,000 acres in Oregon and Washington is starting a program of planting spruce to be grown on a 40-year rotation. Trees will be spaced 10 by 10 feet and each 40-acre tract will be surrounded by fire breaks planted with alder. A lumber company in the same region proposes to plant 1500 acres a year to Douglas fir, Port Orford cedar and redwood.—*Duncan Dunning.*

3459. ANONYMOUS. School nurseries. *Univ. Nanking, Agric. and Forest. Ser.* 1¹: 1-22. 3 fig. 1920.—Methods of establishing and tending forest nurseries in connection with schools are described. Chinese tree species which may be used are listed with specific directions for planting.—*W. C. Lowdermilk.*

3460. ANONYMOUS. Western Forestry and Conservation Association annual. *Timberman* 27²: 70, 74, 76, 78, 80, 227-230. 1925.—This is a summary of reports and addresses concerning weather and forest fires, slash disposal, fire prevention, timber insurance, taxation, forest insects, tree diseases, reforestation, and forest research.—*Duncan Dunning.*

3461. ALLEN, E. T. The "Western Forestry" research plan. *Amer. Forests and Forest Life* 30: 420, 448. 1924.

3462. BAIIEVSKY, BORIS. Forest resources of Siberia. U. S. Dept. Commerce Trade Information Bull. 378. 1-39. Fig. 1-3. 1925.—This is a compilation of data on the extent

and character of the forests in the different parts of Asiatic Russia, and their past, present, and probable future exploitation. A bibliography is appended.—*W. N. Sparhawk.*

3463. BEAUCLERK, O. Notes on Swedish forestry. *Quart. Jour. Forest.* 19: 273-277. 1925.

3464. BERGER, L. G. DEN, EN F. H. ENDERT. Belangryke houtsoorten van Nederlandsch-Indie, Deel I. [Important woods of the Netherland-Indies, Part I.] Mededeel. Proefsta. Boschw. 11. 1-136. 60 fig. 1925.—The principal aim of this publication is to furnish trustworthy information for the timber trade, but it furnishes also important scientific material. In this volume some 56 species or groups of species with similar wood from the families Taxaceae to Dipterocarpaceae inclusive (Engler and Prantl) are treated. The descriptions are based upon wood samples of each species, accompanied by herbarium material. Each description contains the following subjects: Scientific name, vernacular and trade names, description of the tree, strength and durability, anatomical description of the wood, properties and use of the wood, and timber trade. The anatomical description is based on the inspection of the samples with a 10-power magnifying-glass, which gives practically as good a basis for identification as greater magnification.—*Ch. Coster.*

3465. BOUKASOFF, S. Nota acerca de la expedición botánica rusa en América Latina. [Note on the Russian botanical expedition to Latin America.] *México Forest.* 3: 171. 1925.—The expedition, seeking economic plants for introduction into Russia, is interested in trees that will thrive in cool or temperature climates.—*W. N. Sparhawk.*

3466. BRAUN, E. VON. Über künstliche Tannenvorverjüngung. [Artificial advance reproduction of fir.] *Forstwiss. Centralbl.* 47: 804-809. 1 fig. 1925.—In certain districts of Bavaria, natural or artificial reproduction of fir in mixed forest of spruce, fir, and beech has been difficult because of browsing by game. By planting 2-3 year old seedlings in the angles between the roots and close against the trunks of the old trees, a few years before these are cut, the seedlings escape browsing. They are less likely to be injured by logging operations than seedlings in the open. On level land they should be planted on the sides where they will be least exposed to excessive direct sunlight and heavy rains; on slopes they would be planted on the sides rather than above or below the tree.—*W. N. Sparhawk.*

3467. BREWSTER, DONALD R., AND JULIUS A. LARSEN. Girdling as a means of removing undesirable tree species in the western white pine type. *Jour. Agric. Res.* 31: 267-274. 1925.—*Tsuga occidentalis* and *Abies grandis* invariably associate with *Pinus monticola* throughout northern Idaho. They are so generally defective as to make it unprofitable to harvest them. Furthermore, these weed species restock the ground in such abundance as to exclude the more valuable pine. Various methods of girdling were tried, such as severing the bark in a narrow ring without cutting the sapwood, peeling off a 2-foot ring of bark all around the stem, and cutting through both bark and sapwood. Up to the time this progress report was written, the tests indicated little in favor of either method.—*J. A. Larsen.*

3468. BRUCE, DONALD. Need for a new log rule. *Timberman* 27: 214, 216-218, 220. 2 fig. 1925.—Clark's International Rule ($\frac{1}{4}$ inch kerf) is recommended.—*Duncan Dunning.*

3469. BUSSE. [Rev. of: BUSSE UND JAEHN. Wachsraum und Zuwachs. (Spacing and growth.) *Mitteil. Sachs. Forstl. Versuchsanst. Tharandt* 26: . *Illus.* 1925.] *Deutsch. Forstzeitg.* 40: 1182-1184. 1925.—It is concluded that wide spacing (3-4 sq. m. to a plant) should be used where lack of market for small material and lack of labor make thinning impracticable. Medium spacing (1-3 sq. m.) gives best results, in both value and volume production. Close spacing (less than 1 sq. m.) should be used only where labor and market conditions allow early and frequent thinnings. (See also this issue, Entry 3517).—*W. N. Sparhawk.*

3470. CRAIGHEAD, F. C. Experiments with spray solutions for preventing insect injury to green logs. *U. S. Dept. Agric. Bull.* 1079. 1-11. 1922.—The bulletin describes the relative effectiveness of several chemicals in repelling attacks of wood borers. The general requisites of such a spray, its practical limitations, and types of insect injury are also discussed.—*Author.*

3471. CRAIGHEAD, F. C. Relation between mortality of trees attacked by the spruce budworm (*Cacoecia fumiferana* Clem.) and previous growth. *Jour. Agric. Res.* 30: 541-555.

Fig. 1-5. 1925.—The study indicates that there is a definite correlation between the mortality in spruce and fir stands (as a result of spruce budworm defoliation) and the rate of growth of the trees prior to attack. The more rapid the growth in diameter, the lower is the mortality, under equal conditions of feeding. This relationship is more tangible than any of the other factors heretofore considered and should serve as a practical basis for preventive measures, namely, silvicultural practices which maintain rapid growth.—A comparison of the rate of growth of trees surviving budworm attack shows that the diameter growth for the 10-year period following the 1st year of feeding is only about $\frac{1}{2}$ that of the preceding 10 years.—In hardwood types the immunity of spruce and fir was proportional to the protection afforded by the overstory of hardwood foliage. The percentage of mortality among dominant spruce and fir in mixed stands was as high as in pure softwood stands.—*Author.*

3472. CURRAN, HUGH M. A tropical forester visits Latin America. Reprint from Bull. Pan-American Union. 6 p., 4 fig. 1925.—“South America has an unlimited supply of commercial woods to replace both hard and soft woods of the temperate regions.”—*From author's summary.*

3473. CURRAN, HUGH M. Forest conditions in southeastern Bahia, Brazil. Tropical Woods 2: 6-9. 1925.—This is a brief description of a tract in the Rio Grongogy basin. Of more than 100 species of trees more than 1 foot in diameter, not over 20 are of much commercial importance and fully $\frac{1}{2}$ the stand is of 10 species. Only a few are in the class of cabinet and fancy woods, the majority being plain woods of general utility. On a typical acre, 42% of the trees had soft wood, 30% medium, and 28% very hard.—*W. N. Sparhawk.*

3474. DALLIMORE, W. Arboretum notes. Quart. Jour. Forest. 19: 228-234. 1925.—This is a description of 11 European and North American species of *Picea*, with notes on identification, macroscopic features of the wood, uses, soil requirements, propagation, and pests.—*P. S. Spokes.*

3475. DALLIMORE, W. Arboretum notes. Quart. Jour. Forest. 19: 265-272. 1925.—This is a description of 15 Asiatic species of *Picea*, with notes on identification and general habits.—*P. S. Spokes.*

3476. DURLAND, W. D. Porto Rico's violet tree. Amer. Forests and Forest Life 31: 475. 2 fig. 1925.—*Phlebotaenia Cowellii* Britton is one of the rarest plants of the West Indies. Botanical explorations so far have discovered but 6 living specimens.—*Chas H. Otis.*

3477. EGERMARK, MAUR. P. Betesskador. [Grazing damages.] Skogen 12: 293-296. 3 pl. 1925.—In Sweden the present increasing tendency to graze in forests near villages, instead of less intensive pasturage far away in the forest, is accompanied by serious consequences to young stands. The damage, which results in bushy trees and open stands, is equally severe in even-aged and in selection forests.—*Henry I. Baldwin.*

3478. ELLIS, L. MACINTOSH. First quinquennial review of the operations of the national forest policy, together with the annual report of the director of forestry for the year ended 31st March 1925. 35 p. 23 fig. Government Printer: Wellington, New Zealand, 1925.—The review has sections on forest policy, forest management, silviculture, forest protection, forest utilization, and a program of action for 1925-1935. In the 5 years, 7,485,590 acres have been dedicated to forestry. The establishment of a forest products laboratory is advocated.—The annual report includes sections on forestry progress, research and experiments, and statistical annexures. A study of the beech forests has been completed, and investigations on the tawa (*Beilschmiedia tawa*) forests and the Westland taxad forests are under way. There are now 62,945 acres of planted State forest.—*H. H. Allan.*

3479. F., C. E. C. [Rev. of: SCHLICH, WILLIAM. Schlich's manual of forestry. Vol. 3. Forest management including mensuration and valuation. 5th ed. rev. viii + 383 p. Bradbury, Agnew and Co.: London, 1925.] Nature 116: 353. 1925.

3480. FLAHAULT, CH. La mise en valeur des terres pauvres par le boisement. [Increasing the value of poor land by forestation.] Prog. Agric. et Vitic. 74: 546-550, 566-572; 75: 39-46. 1920.—The author makes an appeal for forestation and advises as to the species to be planted and the methods of handling them.—*E. L. Proebsting.*

3481. GEIGER, RUDOLF. Untersuchungen über das Bestandsklima. II. [Investigations of the climate of the stand. II.] Forstwiss. Centralbl. 47: 848-854. Fig. 0-7. 1925.—

Wind velocity, temperature, and relative humidity were investigated at 6 different heights from 1.1 m. above the ground to just above the tree crowns. It is concluded that measurements at 3 points (above and within the crowns and near the ground) will suffice for studying climatic conditions in the forest.—*W. N. Sparhawk.*

3482. GEIGER, RUDOLF, UND ERNST. *Untersuchungen über das Bestandsklima I.* [Investigations of the climate of the stand, I.] *Forstwiss. Centralbl.* 47: 629-644. *Fig. 1-5.* 1925.—The object of the 1st study, which is being made by the Bavarian Forest Exp. Sta., is to ascertain the differences in air temperatures, atmospheric humidity, and wind movement between stands with uniform, closed crowns and other stands similar in every respect except that they have uneven, many-storied crowns. Continuous readings are made simultaneously, by means of self recording instruments set at various levels above the ground on 17.5 m. wooden towers. The set-up of the instruments and the construction of the towers are described in detail.—*W. N. Sparhawk.*

3483. GIACOBBE, A. *L'Erica arborea, suoi prodotte e il suo valore economico.* [*Erica arborea, its products and its economic value.*] *L'Alpe* 12: 181-186, 204-209. *1 fig.* 1925.—The wood of the stump and the larger roots is prized for making tobacco pipes and for veneer and inlay work. Descriptions of the character of the stump and methods of extraction and utilization are followed by a discussion of the economic importance of the plant.—*R. Ciferri (translated).*

3484. GREELEY, W. B. The relation of geography to timber supply. *Economic Geography* 1: 1-14. *14 figs.* 1925.

3485. GREENSTREET, V. R. Further studies on jelutong. *Malayan Agric. Jour.* 13: 1-8. *1 fig.* 1925.—The latex of *Dyera* spp. (jelutong) is now collected in large quantities from forest trees as a cheap substitute for West Indian chicle in the manufacture of chewing gum. Experiments with various coagulants showed sodium silicofluoride and H_2SO_4 to be best. Experiments dealing with the rate of loss of moisture, changes in resinification, and the development of moldiness are also described.—*R. E. Holttum.*

3486. GROSS, A. *Abriss der Geschichte und der waldbaulichen Verhältnisse des Tharandter Reviere.* [Silvicultural history of the Tharandt Forest.] *Tharandter Forst. Jahrb.* 76: 1-24. 1925.—Gross reviews the changes that have taken place during his 30 years of service and summarizes the lessons learned since Heinrich von Cotta took over the management of the forest in 1811. The attempt to grow spruce on pine sites has had a bad effect on the soil. Clear cuttings more than 100 m. wide are also detrimental. White pine, red oak and Douglas fir are the best exotic species. The cupping of spruce for turpentine during the War has had bad results.—*K. W. Woodward.*

3487. HERRMANN. [Rev. of: FEUCHT, OTTO. *Die Bodenpflanzen unserer Wälder.* (The subordinate vegetation of our forests.) *Illus.* Strecker & Schroeder: Stuttgart, 1925.] *Deutsch. Forstzeitg.* 40: 1107. 1925.—The book is particularly valuable for its discussion of the relation of the soil cover to environment, and especially to silvicultural treatment of the forest.—*W. N. Sparhawk.*

3488. HUTCHINSON, H. P. Manurial requirements of the basket-willow. *Univ. Bristol Ann. Rept. P.* 109-119. 1924.—Results of field experiments not having given consistent data, pot experiments were begun in 1923. The plants were grown in sand and were watered with nutrient solution, one series being watered with a complete solution and others, with each of the elements successively omitted. With N omitted growth was little if any better than with rain water alone. Omission of P greatly reduced growth; omission of Ca, Mg, or K was not appreciably injurious.—*W. H. Chandler.*

3489. ILLICK, J. S. The black oaks. *Amer. Forests and Forest Life* 31: 488-493. *10 fig.* 1925.

3490. JONES, W. B. *La ceiba, the silk cotton tree of Mexico.* *Amer. Forests and Forest Life* 30: 463-464. *2 fig.* 1924.—*Xylum pentandrum* Gartn. (*Eriodendron anfractuosum* D.C.) is briefly described.—*Chas H. Otis.*

3491. JUHLIN-DANNEFELT, MATTS. *Avverkningsmetoder i Amerikas Förenta Stater.* [Logging methods in the U. S. A.] *Skogsvårdsför. Tidskr.* 23: 251-306. *36 pl.* 1925.—Such typically American logging methods as power-skidding are essentially the accompaniment

of virgin forest exploitation, and can find little application in Europe. In every case logging and transportation practices reflect the broad climatic, topographic, and economic conditions in the region.—*Henry I. Baldwin.*

3492. JUHLIN-DANFELT, MATTS. Zinksulfat sasom bekämpningsmedel mot ogräs i plantskolar. [Zinc sulphate as a means of combatting weeds in nurseries.] Skogen 12: 297-303. 1925.—Sprinkling the soil with solutions of zinc sulphate (as in experiments at the Savenac Nursery in Montana, U. S. A.) had no effect upon seedlings of *Pinus sylvestris* and *Picea excelsa*, but reduced the number of weeds by about 50% as compared with untreated beds. The treatment does not appear to be as efficacious in a moist climate like that of Sweden as in a dry climate.—*Henry I. Baldwin.*

3493. KOMÁREK, JULIUS. Zur Verbreitung des *Ips typographus* und *Ips cembrae* in mitteleuropäischen Waldungen. [Distribution of *Ips typographus* and *I. cembrae* in the forests of central Europe.] Forstwiss. Centralbl. 47: 858-865. 1 fig. 1925.—The range of the spruce bark beetle, *Ips typographus*, coincides with the natural range of spruce, and the beetle does not occur in spruce forests planted outside of its original range, which is confined to localities with annual precipitation above 800 mm. The absence of the beetle from the Brdy mountains southeast of Prague is believed to indicate that spruce, which is now grown extensively, is not native there.—*I. cembrae*, the larch bark beetle, was found attacking spruce which had been injured by the nun moth in localities where the spruce beetle was lacking. Contrary to the views of several writers, this beetle does not appear to be essentially an alpine species, but its natural range is believed to coincide with that of larch.—*W. N. Sparhawk.*

3494. KRAMER, F. Het verjongingsonderzoek van sandelhout (*Santalum album* L.) op Java. [Investigation of the regeneration of sandalwood (*Santalum album* L.) in Java.] (English summary.) (Korte mededeel. Proefsta. Boschw. 10.) Tectona 18: 455-498. 6 fig. 1925.—The investigations were carried out in eastern Java, at a place with a dry east monsoon, at an altitude of 200 m. above sea level. The roots of sandelwood seedlings need from earliest youth to be in touch with the roots of a host plant. During further development the roots, which remain in the upper soil layers and spread widely, continually have to meet new host plants. When there are sufficient host plants the sandalwood grows rapidly, some plants attaining heights of 1.2 m. in 2 months. A score of 6 year-old trees on good soil grew at a mean annual rate of 1.5 m. in height and 2 cm. in diameter. These trees flowered at the age of 2½ years and for the last 2 years bore fruit profusely. Phenological observations have not yet indicated any periodicity in flowering or fruiting, for the trees may be in flower or bearing fruit at any time throughout the year. Natural regeneration may be abundant with large proportion of survival. Damage by plant pests was very small.—*Ch. Coster.*

3495. KRAMER, F. Kulturproeven met industrie-, kónstruktie- en luxe-houtsoorten. [Investigations regarding the cultivation of different Javanese trees.] (English summary.) Mededeel. Proefsta. Boschw. 12. 1-99. 27 fig. 1925.—This publication contains detailed notes on the cultivation of 40 important species of Javanese trees, based principally on the 200 experimental plots at Gadoengan, eastern Java, on good volcanic sand. All plantations are less than 10 years old. For each species data about seed and germination, early growth, form of the young trees, density of canopy, various pests, and many growth statistics are given. Photographs of the more important species are shown.—*Ch. Coster.*

3496. KRUTZSCH. Das Luftbild im Dienste der Forsteinrichtung. [Aerial photographs in forestry.] Tharandter Forst. Jahrb. 76: 97-150. 1925.—The best instruments and the ways in which the photographs can be used are discussed.—*K. W. Woodward.*

3497. LARSEN, J. A. Natural reproduction after forest fires in northern Idaho. Jour. Agric. Res. 30: 1177-1197. Pl. 1-5, fig. 1-2. 1925.—The paper presents the results of an intensive study of natural restocking by tree seedlings of burned forest lands in the western white pine type in Idaho. These areas had been burned severely, some once, others twice, during 1910 and 1919, and practically no green trees were left over large stretches of country. By counting the seedlings on strips run in various directions and at different elevations and by studying their ages and their distribution in relation to the parent trees, it was possible to determine the manner in which reproduction came about. The large double burn of 1910 and 1919 contained a few seedlings on protected north and east slopes but practically none

on the warmer and drier south and west slopes. Those on the north slopes clearly originate from trees which had survived the 1910 burn but which succumbed in 1919. Many of these were veteran larches which resist fire due to their thick bark. On the better sites twice burned areas contained also groups of western white pine seedlings which were remnants of those that came in after the 1910 fire. Such groups, though relatively rare, will produce seed within 20 years. Occasional groups of live trees which survived both burns are now functioning as seed trees, but restocking is taking place only to the northward and eastward and then only on favorable sites such as flats or lower slopes facing the north and east. The lower south slopes present the most adverse conditions for natural restocking, for the finer particles of soil are being leached out and washed down into the creeks, leaving a residue of fine material which becomes quite dry and warm in mid summer, thereby rendering natural as well as artificial restocking extremely difficult. Except on the lower parts of draws the double burns show very little gullying. Frequently a heavy sod is formed on the lower exposed slopes, which hinders natural restocking. On areas burned over once and on those where fires occurred at least 40 years apart, natural restocking is generally satisfactory, with a good proportion of western white pine. Even once-burned areas, however, present a serious fire menace in the great quantity of standing and down dead trees. Most of the seedlings coming in after a single burn started within 5 years, principally during the 4th and 5th years after the fire. Light seeded species such as goldenrod, everlasting willow, and fire weed quickly cover the double burns. This 1st stage of succession is followed by brushy growth of maple, alder, June berry, and snow brush, which hold the soil in place, build up a layer of leaf mould, and shelter the seedlings of conifers which finally become established.—*Author*.

3498. LEATHER, G. F. T. *The replanting of cleared areas*. *Quart. Jour. Forest.* 19: 181-186. 1925.—Many of the large forest tracts cut over in the British Isles during the great War have not been replanted. Various schemes of legislation to ensure replanting of woods felled in the future are discussed. The author's proposal that anyone clear-cutting an area of 2 acres or more should be compelled by Act of Parliament to deposit with the Forestry Commission a sum equal to £10 per acre. The commission would hold this in trust, without interest, until the land was reported to have been satisfactorily replanted, when the deposit would be returned to the planter. If the land should not be replanted within 5 years the deposit would be forfeited.—*P. S. Spokes*.

3499. LECOMTE, HENRI. *Atlas des bois de l'Indo-Chine*. [Woods of Indo-China.] xvi + 254 p., 247 fig. Agence Economique de l'Indochine: Paris, 1919.—For each of 123 species there are given a botanical description of the tree and a brief statement of the principal anatomical characteristics of the wood, with photomicrographs (30 X) of transverse and tangential longitudinal sections. The wood samples, with botanical material, were collected by the Auguste Chevalier expedition.—*W. N. Sparhawk*.

3500. LE SUEUR, A. D. C. *Commercial forestry*. *Quart. Jour. Forest.* 19: 213-227. 1925.—The author discusses a forest policy for the British Isles. The state of existing woods and plantations, reforestation and afforestation, and the general business methods involved are dealt with.—*P. S. Spokes*.

3501. LOWDERMILK, W. C. *A forester's search for forests in China*. *Amer. Forests and Forest Life* 31: 387-390, 427, 444-445. 12 fig. 1925.—This is an account of a 2,000 mile journey and of the vegetation encountered en route.—*Chas. H. Otis*.

3502. LOWDERMILK, W. C. *Factors affecting reproduction of Engelmann spruce*. *Jour. Agric. Res.* 30: 995-1009. Pl. 1-6. 1925.—The laws of natural reproduction in spruce stands should govern the methods of marking and slash disposal.—Large quantities of spruce seed are produced at intervals of 3-4 years. Only a few of these germinate and survive, and then only under certain conditions. Studies were made of natural reproduction of spruce in the upper, lower, and central altitudinal zones of the spruce type, giving special attention to conditions favoring reproduction in the natural forest, in burned and in cut-over areas. The principal conclusions are as follows: (1) Reproduction from seed deposited in the duff cannot be depended on as in the case of western white pine. (2) Showers of seed over the cut-over tract must be provided for during several years following cutting. (3) Under favorable moisture conditions Engelmann spruce restocks quickest on exposed mineral soil and on lightly

burned surfaces. (4) The conservation of soil moisture throughout the critical dry period is essential. On the basis of these conclusions, methods of cutting and slash disposal are specified.—*Author*.

3503. LUNDH, ERIK. Produktionsundersökningar å avdikade marker inom Bjufors Kronopark. [Production investigations on drained lands in Bjufors Crown Forest.] Skogsvårdsför. Tidskr. 23: 195-248. Pl. 1-14. 1925.—Ditching has been in progress on a very considerable scale in the Bjufors forest since 1897. Study of many sample plots has shown that draining has raised the site quality by 2-4 classes, and has increased the volume growth 2-6 times.—*Henry I. Baldwin*.

3504. M., G. [Rev. of: HOGDAHL, THOR. Naturskydd i Sverige. (Preservation of natural resources and scenery in Sweden.) 277 p. P. A. Nordstedt & Söner: Stockholm, 1925.] Skogen 12: 311. 1925.—The book is said to be a useful compendium and handbook of conservation.—*Henry I. Baldwin*.

3505. MARTIN, H. Die Theorie der Werte und die Theorie der produktiven Kräfte in der Forstwirtschaft. [The effect on forestry of the theory of value and the theory of productive capacity.] Tharandter Forst. Jahrb. 76: 63-71. 1925.—Martin compares the effect upon forest conservation of following out Adam Smith's theory of unrestricted competition or List's plan of building up local and state productivity.—*K. W. Woodward*.

3506. MUNRO, J. W. Note on the felted beech Coccus. Quart. Jour. Forest. 19: 282-289. 1925.—The author gives the history of the scale insect, *Cryptococcus fagi*, and a summary of Boodle's and Dallimore's investigations into the damage done by this insect in the British Isles. It is thought that the dying off of beech is not an entomological problem but a botanical and silvicultural one, requiring the study of the conditions under which beech may be grown without suffering from drought.—*P. S. Spokes*.

3507. NEWELL, F. H. Forests and waters. Amer. Forests and Forest Life 31: 407-409, 424. 3 fig. 1925.

3508. NIKLAS, H. Über die Ergebnisse von Saftuntersuchungen von Laubund Nadelhölzern, das Vorkommen von stickstoffsammelnden Bakterien in Waldböden und die Feststellung des Nährstoffbedürfnisses und der Impffähigkeit von Böden. [Results of studies of the sap of conifers and broad-leaved trees, the presence of nitrifying bacteria in forest soils, and the determination of deficiency of nutrient material and of the possibility of inoculating soils.] Forstwiss. Centralbl. 47: 830-833. 1925.—The sap of leaves is less acid than that of needles. Soil acidity appears not to influence the acidity of the sap. Azotobacter are not present in acid soils, nor can they be introduced in such soils by inoculation, unless any deficiency of the essential nutrient materials (phosphoric acid, lime, potash) is remedied. Such deficiency may be determined by biochemical methods.—*W. N. Sparhawk*.

3509. OLIPHANT, J. N., C. HUMMEL, AND DUNCAN STEVENSON. British Honduras. Annual report of the Forest Trust for the year ended 31st March, 1925. 26 p. Clarion Press Belize, 1925.—The usual data on forest areas, finances, personnel, and exports and imports are presented. Considerable silvicultural work has been done, chiefly in "improvement" of mahogany and other valuable species of trees. This consists of freeing them from climbers and competing trees of inferior species. Girdling the competing trees was found preferable to felling them, for mahogany seedlings were injured by sudden exposure to full sunlight. Experiments were started in improving polak (*Ochroma lagopus*) and moho (*Hibiscus* sp.), which grow very rapidly and may become important sources of cellulose. Information is being gathered regarding the various kinds of native timber trees. The chief silvicultural need in perpetuating the pine forests, which are extensive, is fire protection.—Brief reports on the forestry operations of 2 large companies are appended. One of them is concentrating its efforts on sapodilla trees, for the production of chicle. The local chicle industry has been on the decline because of destructive methods of tapping hitherto employed. This company is conducting comprehensive studies on the distribution, site requirements, growth, yield, natural and artificial reproduction, and methods of tapping sapodilla (*Achras zapota*).—A report is given of the Botanic Sta. which maintains an ornamental garden and a nursery for propagating economic and ornamental plants, but is conducted mainly as a forest experiment station. Its principal work has been the demonstration of methods of getting natural reproduction of mahogany by silvicultural methods.—*W. N. Sparhawk*.

3510. PRELL, HEINRICH. Das Rätsel des Eichentriebschnittes. [The riddle of damage to oak.] Tharandter Forst. Jahrb. 76: 49-62. 1925.—The ant, *Camponotus herculeanus* L., seems to be responsible for a large amount of damage to the terminal shoots of oak trees. The best way to control this injury is to destroy the nests.—K. W. Woodward.

3511. RAHM, TH. Sandelhout op Timor. [Sandalwood on Timor.] (English summary.) (Korte Mededeel. Proefsta. Boschw. 11.) Tectona 18: 499-545. Map. 1925.—Sandal occurs in the island of Timor in deciduous forests at an altitude of 50-800 m. In the native forests its rôle is probably quite subordinate. Its spreading is closely associated with the shifting cultivation of the natives because it finds the best conditions for its growth on old fields, and it is now largely confined to such lands, occurring isolated or in small groups. The seed are spread by birds. In Timor it grows best in districts with 1100-2000 mm. of rain. Generally only a few seedling plants are found; many of the seed are eaten by ants and birds, and the seedlings as a rule are smothered by weeds. Most trees proceed from root suckers. The main interest is in the production of heartwood which contains the oil. Trees with heartwood can be distinguished by the character of the bark several meters from the ground and by their yellowish foliage. Probably the largest production will be attained at the age of 40 years.—Ch. Coster.

3512. RECORD, SAMUEL J. Jacaranda copaia in British Guiana. Tropical Woods 3: 6-8. 1925.—This tree is fairly abundant in the mixed hardwood forests of the Colony, particularly along the coasts and the larger streams. It grows rapidly and has soft, light wood, which resembles and may be mistaken for that of *Simaruba amara*, a more desirable wood. Distinguishing characteristics of the 2 woods are given.—W. N. Sparhawk.

3513. RECORD, SAMUEL J. Schizolobium: a promising source of pulpwood. Tropical Woods 2: 2-5. 1925.—Notes are given on the distribution of various species of this genus, with a detailed description of *S. Kellermanii* Pittier. Tests have shown that the wood is well adapted for pulping by the soda process.—W. N. Sparhawk.

3514. RECORD, SAMUEL J. The Chinese "pau hoi." Tropical Woods 3: 1. 1925.—The wood of this tree (*Machilus Thunbergii* or *Cinnamomum* sp. ?) is so mucilaginous that water in which chips or shavings have been soaked acquires a ropy consistency, and is used for hair-dressing in the Orient.—W. N. Sparhawk.

3515. RECORD, SAMUEL J. Wooden combs. Tropical Woods 2: 13-14. 1925.—This consists of notes on the kinds of wood used for combs in Egypt, Greece, Japan, Philippines, and Salvador.—W. N. Sparhawk.

3516. REILLY, J. The destructive distillation of wood. [Rev. of: KLAR, M. The technology of wood distillation: with special reference to the methods of obtaining the intermediate and finished products from the primary distillate. xv + 493 p. Translated by ALEXANDER RULE with an additional chapter by the translator. Chapman and Hall: London, 1925.] Nature 116: 779-780. 1925.

3517. REINHOLD. [Rev. of: FRITSCH. Über den Einfluss der Anbaumethode auf den Ertrag der Fichte. (Influence of method of establishment on yield of spruce.) Mitteil. Sächs. Forstl. Versuchsanst. Tharandt 2²: 1919; and BUSSE und JAEHN. Wachsraum und Zuwachs. (Spacing and growth.) Mitteil. Sächs. Forstl. Versuchsanst. Tharandt 2⁶: 1925.] Fortwiss. Centralbl. 47: 809-812. 1925.—These papers present the results of the 5th and 6th remeasurements (1911 and 1922) of the 19 Wernsdorff sample plots, established in 1862 to determine the effect of method of establishment and spacing upon growth of spruce. Broadcast seeding gave poorest results followed by sowing in drills, seed-spots, and planting in clumps; planting singly was best. The best spacing was 1.13×1.13 m., although this might not be true for regions where small material is not marketable. Close spacing retarded height growth. With wide spacing (not excessively wide) there were relatively fewer knots than with narrow. Fairly wide spacing is recommended where there is little demand for small timber. (See also this issue, Entry 3469.)—W. N. Sparhawk.

3518. REYNOLDS, R. V., AND A. H. PIERSON. Tracking the sawmill westward. Amer. Forests and Forest Life 31: 643-648, 686. 4 maps, 2 fig. 1925.—This is a story of the westward movement of the lumbering industry in the U. S. A. since 1770.—Chas. H. Otis.

3519. RICALTON, J. The bamboo. Amer. Forests and Forest Life 30: 473-475, 502. 3

fig. 1924.—This is a popular article on bamboo (*Bambusa arundinacea* and *Dendrocalamus giganteus*), its growth and its uses.—*Chas. H. Otis*.

3520. RIDGWAY, R. The largest pecan tree. *Amer. Forests and Forest Life* 31: 694. 1 fig. 1925.—A pecan tree growing in Indiana was 175 feet high and 39 feet in circumference at the ground.—*Chas. H. Otis*.

3521. SALE, G. N. Cyprus oak plantation. *Cyprus Agric. Jour.* 20: 97-98. 1925.—Cyprus oak (*Quercus infectoria*), although it grows vigorously, is seldom suitable for timber purposes because either the trunk is crooked or disease has destroyed the heartwood. The forest department has planted about 4 acres with acorns of this oak in order to determine whether it can be grown in such a manner as to yield commercial timber. A fair prospect of success is reported.—*W. Stuart*.

3522. SECREST, EDMUND. Forest grazing. *Amer. Forests and Forest Life* 30: 457-458, 470. 3 fig. 1924.—Not only does grazing seriously reduce the wood-producing capacity of woodlands in the Ohio Valley, but grasses growing in the shade are less palatable and nutritious than those in the open.—*W. N. Sparhawk*.

3523. SEITNER, M. Beobachtungen und Erfahrungen aus dem Auftreten des achtzähligen Fichtenborkenkäfers *Ips typographus* L. in Oberösterreich und Steiermark in den Jahren 1921 und 1922. [Observations on the epidemic of the spruce bark beetle *Ips typographus* in Upper Austria and Steiermark in 1921-1922.] *Centralbl. Gesam. Forstw.* 49: 1-11, 149-162, 270-277. 1 fig. 1923; 50: 2-23. 1 pl. 1924.—Approximately 1,500,000 cu.m. of spruce timber was killed in the most disastrous bark beetle epidemic that has ever been recorded in the Austrian Alps. Many trees which were overthrown by the wind in 1916-1917 could not be removed because of labor shortage and afforded breeding places for the beetles, whose rapid increase was further favored by a succession of dry summers. The forest contained an undue proportion of old spruce, which is generally susceptible to wind damage.—The severity of an insect epidemic is dependent on the "spread factor," which is defined as the effective reproductive energy of the beetle. This factor may be 5-7 at the beginning of an epidemic, becoming smaller as parasites, diseases, and other enemies increase. A method of determining the spread factor is described.—The life cycle of the beetle and the way in which it passes the winter are outlined. Control measures consist of peeling the infested stems and burning the bark, unless the larvae are less than $\frac{1}{2}$ grown, when it is sufficient to spread the bark out so that it will dry quickly. Trap trees should also be felled at 4-week intervals from May to September to catch the beetles which are missed in the peeling.—The principal parasites are described in detail. The history of the epidemic shows that the natural enemies alone cannot be depended upon to put an end to bark beetle epidemics, though they may help in checking rapid spread.—*W. N. Sparhawk*.

3524. SINZ, R. Beitrag zur Geschichte des Naunhofer Staatswaldes. [History of the Naunhofer State Forest.] *Tharandter Forst. Jahrb.* 76: 25-48, 72-93. 1925.—The financial returns, the losses from fire, insects, and fungi, the uses of by-products and the methods of administration are dealt with.—*K. W. Woodward*.

3525. SLATER, A. Japanese larch. *Quart. Jour. Forest.* 19: 237-238. 1925.—The author gives his experience with commercial planting of Japanese larch in Gloucester County, England, on sandy loam at an elevation of 150 feet. Detailed measurements of plantations are given.—*P. S. Spokes*.

3526. SNEPVANGERS, F. De leeftyd der natuur-djatibosschen. [The age of the natural teak forests.] *Tectona* 18: 602-605. 1925.—The writer concludes that the age of the natural teak forests in Java generally will not surpass 150 years, although there may be individual trees that survive for several hundred years.—*Ch. Coster*.

3527. STEVENSON, DUNCAN, AND NEIL S. Some secondary timbers of British Honduras. *Tropical Woods* 4: 12-16. 1925.—This paper consists of descriptions of the trees and timber of banak (*Myristica panamensis* Hemsley, or *Virola panamensis* Warb.), santa maria (*Calophyllum Calaba* Jacq.), yemerí (*Vochysia hondurensis* Sprague), and tamarind (*Acacia glomerosa* Benth.).—*W. N. Sparhawk*.

3528. TAYLOR, W. L. New forests in East Anglia. *Quart. Jour. Forest.* 19: 192-212. Fig. 1-7. 1925.—This is a description of the activities of the British Forestry Commission

since 1919 in the eastern counties of England. The Rendlesham Forest, with an area of 4604 acres, is $2\frac{1}{2}$ -3 miles from the sea at an elevation of 50 feet. The land consists mostly of old heaths with some arable land, the soil being a light sand with occasional gravel patches. Another similar forest, Thetford Chase (20,329 acres), in the same district is also described together with a tract of 4753 acres near Swaffam in western Norfolk County. The climate, natural flora, method of preparing the ground for planting, species and cost of planting, nursery work and sowing experiments, damage by fire and insect pests, and methods of exterminating rabbits are dealt with. The inauguration of a scheme for forest workers' holdings is described.—*P. S. Spokes.*

3529. THEISS, L. E. Fire weather. *Amer. Forests and Forest Life* 31: 394-396, 441. 4 fig. 1925.—This treats of the relationship between atmospheric humidity and forest fire hazard and the possibility of predicting thunder storms.—*Chas H. Otis.*

3530. TISCHENDORF, WILHELM. Mittelstammdimensionen. [Dimensions of average stems.] *Forstwiss. Centralbl.* 47: 787-798. 1925.—The difficulty of selecting a sample stem that will be a true average for a given stand is discussed. The average stem is the stem of arithmetical average volume, but volume is the product of 3 variables (basal area, height, and form factor), and the product of the averages of these variables will not give the average volume. The difference in volume between the stem of average basal area and the stem of average volume may be practically 0, or it may be as much as 3-5%. The probable error may be reduced by taking several samples.—*W. N. Sparhawk.*

3531. TRESCHOW, AUG. I betesfrågan. [The grazing question.] *Skogen* 12: 281-292. 1925.—Forest grazing is bad for both the cattle and the forest. The best forage plants demand full light. Better yields of milk may be obtained by intensive pasture culture, more than repaying the outlay for fertilizer and labor. Grazing in young forests makes repair planting necessary; the formation of open stands of bushy trees precludes the possibility of returns from thinnings, and results in a final yield less in quantity and poorer in quality than would otherwise be obtained. Present Swedish laws allow, but do not compel the segregation of grazing and forestry.—*Henry I. Baldwin.*

3532. VALE, R. B. The return of Penn's woods. *Amer. Forests and Forest Life* 31: 463-465. 2 maps, 4 fig. 1925.—The State forests of Pennsylvania are briefly described.—*Chas. H. Otis.*

3533. WENMARK, G. Kortare produktions-tid inom skogsbruket. [Shorter production periods in forestry.] *Skogen* 12: 335-337. 1925.—Thinnings and other intermediate cuttings, stimulating the growth so that merchantable dimensions are secured sooner, together with proper care of the soil in preparation for reproduction, and the prompt establishment of reproduction are the most important means of shortening forest rotations.—*Henry I. Baldwin.*

3534. WHITE, C. T. Queensland forests and forest trees. *Queensland Agric. Jour.* 24: 124-128. 1925.—A popular account.—*W. D. Francis.*

3535. WHITE, C. T., AND W. D. FRANCIS. Queensland trees. *Queensland Agric. Jour.* 23: 334-335. Pl. 63. 1925.—The field characters and distribution of *Cryptocarya foveolata* White and Francis, are outlined.—*W. D. Francis.*

3536. WILKE. Nochmals die Aufbewahrung von Saateicheln und Bucheln. [Storage of acorns and beechnuts.] *Deutsch. Forstzeitg.* 40: 1166-1167. 1925.—Acorns and beechnuts have been kept in good condition over the winter by storing them in a dry spot out-of-doors. A heap of acorns 30-40 cm. thick was covered with a layer of spruce or juniper twigs, on which was laid a 15 cm. layer of straw, and the whole was covered with 10-15 cm. of earth.—*W. N. Sparhawk.*

3537. WISE, L. E. Our oldest industry. *Amer. Forests and Forest Life* 30: 404-408. 5 fig. 1924.—This deals with the turpentine industry of the southern U. S. A.—*Chas. H. Otis.*

3538. WOOLSEY, T. S., JR. Battell Forest. *Amer. Forests and Forest Life* 31: 678-681. 4 fig. 1925.—This is a description of a 31,000 acre tract in the Green Mountains of Vermont owned by Middlebury College.—*Chas. H. Otis.*

3539. ZELLÉN, N. C. J. AF. Om plywood. [About plywood.] *Skogen* 12: 313-330. Fig. 1-13. 1925.—The wide use of plywood and veneers in all branches of industry makes it advisable for the forester to consider silvicultural measures which will produce the high quality

trees preferred for veneers. Dry, morainal ridges yield the best Scotch pine plywood stock, where dense, even-aged stands cause the formation of knot-free stems. A rotation of 140-180 years gives the best return. Timber should be transported in long logs, and extreme care exercised to prevent sap-staining.—*Henry I. Baldwin.*

GENETICS

ORLAND E. WHITE, *Editor*

(See also in this issue Entries 3061, 3109, 3115, 3125, 3130, 3137, 3138, 3181, 3209, 3217, 3271, 3323, 3326, 3338, 3343, 3347, 3349, 3628, 3654, 3680, 3714, 3923, 4116)

3540. AAMODT, OLAF S., AND MOSES N. LEVINE. Physiological evidence on the genetic identity of natural and synthetic strains of wild emmer. *Phytopathology* 15: 554-558. 1925.—A comparative study of the reaction of the wild emmer of Palestine (*Triticum dicoccum dicoccoides* Kcke.) and synthetic wild emmer (a segregate from crosses between common and durum varieties of wheat) to 5 biologic forms of *Puccinia graminis tritici* gave further evidence of the genetic identity of the two. Both gave similar reactions toward all 5 biologic forms of the rust.—*B. B. Higgins.*

3541. AKEMINE, MASAO, AND SEISUKE NAKAMURA. [Frequency and causes of spontaneous cross-fertilization in rice plants.] (Japanese.) *Mittel. Landw. u. Forstw. Ges. Sapporo* 16: 1-36. 1924.—In order to learn how often spontaneous cross-fertilization takes place in rice plants, the authors cultivated several varieties of rice side by side. Observations made during 5 years on more than 100,000 plants have shown that the frequency of cross-fertilization amounted to 0.165-1.669% and averaged 0.073%. Often, however, hardly any cross-fertilization takes place. It was further observed that this frequency percentage applies only to crossing between different types grown side by side. Taking into consideration all other cross fertilizations, for example between 2 individuals belonging to the very same type, etc.), the frequency increases to 3%. Frequency of cross-fertilization varies with the year and the varieties. Crossing can only take place when in the open flower the anthers remain closed. This is partly a varietal characteristic and partly due to environment. Lower temperature, for example, as well as greater moisture, contributes to an increase of such flowers and, correspondingly, to the increase of frequency of cross-fertilization. Also, in strains where as a general rule the anthers remain closed when the flower opens, aridity and higher temperature raise the frequency.—*S. Ikeno (Courtesy Japanese Jour. Bot.)—(Transl. by Catherine S. Van Brunt).*

3542. ANDERSON, T. Plant breeding. *Trans. Highland and Agric. Soc. Scotland* 33: 143-179. 1921.—The article contains the history of plant breeding and a discussion of the modern scientific basis of plant improvement. Examples are given from wheat, timothy, potatoes and other crops.—*H. V. Harlan.*

3543. BALLAIS, M. Note sur un *Viola* hybride. [Note on a hybrid *Viola*.] *Actes Soc. Linn. Bordeaux* 75: 97-98. 1923.—The article is a description of a violet found in March, 1921, at Cherval, France, growing among plants of *Viola alba* var. *scotophylla* and *V. odorata*. The name *V. multicolis* is proposed for the hybrid, which is intermediate in color and length of spur between the parents. The petals are pinkish in ground color with lavender veins. The flowers have no odor and produced no seed.—*Mary Ellen Peck.*

3544. BELAR, K. Chromosomen und Vererbung. [Chromosomes and inheritance.] *Naturwissenschaften* 13: 717-723. 1925.—The author is a believer in the constancy of the chromosomes and their significance as the carriers of hereditary characters. The works of many investigators are cited to support this tangible view of inheritance against what he calls the fanciful physico-chemical basis of inheritance supported by R. Fick.—*A. E. Longley.*

3545. BELLAMY, A. W. Bionomic studies on certain teleosts (Poeciliinae). I. Statement of the problems, description of material, and general notes on the life histories and breeding behavior under laboratory conditions. *Genetics* 9: 513-529. *Pl. 1, fig. 1-10.* 1925.—The article gives a record of the preliminary survey preceding a genetic study of the habits and characters of 5 genera of viviparous fish. Two genera, *Xiphophorus helleri* and *Platypoecelus*

maculatus (Günth.), give fertile hybrids, while species crosses are almost uniformly successful. F_1 hybrids are fertile although F_2 and F_3 hybrids are usually sterile. The chromosomes are very small. Two generations in a year are readily obtained and it is possible to raise a reasonably large number of young from each female.—*Robert T. Hance.*

3546. BELING, J. The attraction between homologous chromosomes. *Nature* 116: 244. 1925.—The article calls attention to the fact that during the reduction division the chromosomes of *Datura*, *Hyacinthus* and *Uvularia* are combined side by side and end to end. This behavior points to the presence of twice as many attracting forces as there are pairs of chromosomes, a condition which may account for the formation of trivalents, quadrivalents, etc., in plants with more than 2 homologous chromosomes, and also for the fact that none of the 12 chromosomes of the haploid *Datura* pair at the reduction division.—*Mary Ellen Peck.*

3547. BURGEFF, H. Untersuchungen über Sexualität und Parasitismus bei Mucorineen. I. [Researches on sexuality and parasitism in Mucors. I.] *Bot. Abhandl. Hft. 4. 1-135. 4 pl., 43 fig.* G. Fisher: Jena, 1924.—An attempt is made to find new data in support of the author's view, stated in previous papers, that parasitism is related to sex and has arisen as an attempt at hybridisation. Numerous experiments with hetero- and homothallic forms of Mucors confirm the previous results obtained by Blakeslee chiefly in regard to the perfect and imperfect reactions between (+) and (−) races and give also new data in regard to sexuality. There are volatile and evidently water soluble sexual substances, which cause the mutual attraction between hyphae of opposite sexes. Under the influence of these substances sexual hyphae begin to develop. On the bases of these factors 3 kinds of chemotropic reactions are distinguished—zygotropic, telemorphotic and thigmomorphotic. The transformation of vegetative hyphae and sporangiophores into sexual hyphae and vice versa can be induced in both heterothallic and homothallic species. The morphological and physiological sex characters in branches of homothallic species (*Absidia spinosa*) depend on their situation on the hyphae, the lateral (+) branch may change into a (−) branch when no conjugation occurs.—A detailed study is also made of the parasites, *Parasitella*—1 (+) and 1 (−) race—and *Chaetocladium*—1 (+) race—in regard to gall development and the results are given of contrasts of the parasites with 42 Mucor hosts. A new kind of reaction, imperfect parasitism, is observed in many cases; there is no mixture of nuclei and plasm of host and parasite and the development of galls stops at an early stage. The author believes that a sex-limited relation exists between host and parasite in the case of *Absidia glauca* and *A. caerulea*. Contrasts with all other Mucors show, irrespective of the sex, a perfect or imperfect gall reaction, or no reaction. In the first 2 cases there is a positive chemotropism between hyphae as in the sexual process. The attraction occurs under the influence of a volatile substance. An imperfect hybridization reaction between (−) *Absidia glauca* and (+) *Chaetocladium* was observed. The author concludes that the sexual process and gall formation are similar in the early stages of development. After the fusion of parasite and host, this similarity is less obvious. There are more difficulties in explaining the origin of parasitism in Mucors than was at first believed. The reaction of parasites in the majority of cases with both sexes of the hosts shows that it is not a sexual substance which provokes the reaction between the contrasted organisms, but a certain 3rd substance which ought to be common to both of them. This agent is absent in the *Absidia* species which show a sex limited relation to the parasites, but for it are substituted the sexual substances. This factor, the sexual reaction between (+) *Chaetocladium* and (−) *Absidia glauca*, and the similarity of sexual and parasitic processes, the author believes, show the probable origin of parasitism.—*Sophia Satina.*

3548. BUSSELL, F. P. The value of breeding in crop improvement. *Market Growers Jour.* 34¹¹: 26. 1924.

3549. CAMP, B. H. Probability integrals for a hypergeometric series. *Biometrika* 17: 61-67. 1925.—The article gives methods for approximating to the sum of terms of a hypergeometrical series.—*J. R. Miner.*

3550. CAPINPIN, JOSÉ M. A study of Mendelian inheritance in natural hybrids of rosal (*Gardenia florida*, L.). *Philippine Agric.* 14: 39-43. *Pl. 1, fig. 1.* 1925.—A hundred or more seed from each of 2 fruits of rosal were planted in February, 1923, and produced within a month 54 seedlings, 25 of which flowered by November, 1924, 13 produced double flowers with

2, 3 and 4 sets of petals; and 12 produced single flowers with 5, 6 and 7 petals. The parents were double-flowered with 3 sets of petals. It was concluded that the variation was due to hybrid origin. The parents were, then, heterozygous for multiplicity of corolla, the double form being dominant. Self fertility behaved as a Mendelian character involving 3 factors, self sterility probably being dominant. Two of the seedlings changed flower habit during the season of bloom. One, which bore a single flower June 16, on August 15 produced on the same branch a double flower with 3 sets of petals. The other plant bore a 5-petalled flower June 13 and a 6-petalled flower August 17.—*Mary Ellen Peck.*

3551. CARDOT, HENRY, ET HENRI LAUGIER. Contribution à l'étude de l'accoutumance, de la selection et de la transmission des caractères acquis chez les microbes. [Contribution to the study of habituation, selection and transmission of acquired characters in microbes.] Ann. Physiol. et Physicochim. Biol. 1: 105-121. 1925.—In contrast with most workers in this field, the authors employed salts always present in culture media in considerable amounts rather than highly toxic compounds not normally present. Sodium and potassium chlorides and glycerin were employed. A lactic-acid-producing bacillus and a *Torula* were grown in a casein-peptone medium containing lactose to which the various additions were made. After 6 weeks or more of growth in a solution containing a given concentration of one of the salts or glycerin, frequently renewed, the *Torula* showed decided increase in rate of growth in that concentration, and was able to grow in higher concentrations either of the salt originally used or of the other substances. This is not merely an adaptation to increased osmotic pressure, since cultures with KCl show a specifically greater adaptation to high concentration than did the others. The lactic acid organism showed similar results with the salts, but did not develop increased resistance to glycerin. Cultures continued for 2 years in a medium containing 34.2 gm. KCl per liter have developed resistance to high concentrations of KCl, NaCl, MgCl₂ and MgSO₄, and produce more intense and rapid fermentation than do stock cultures. Cultures grown in presence of KCl for 2 years, then in ordinary media for 1 year, retain their resistance to potassium and their increased powers of fermentation, but gradually die out when grown in mixed cultures on ordinary media. Such modified strains may be preserved indefinitely in pure culture without loss of the acquired characters.—*Joseph S. Caldwell.*

3552. CASTLE, W. E. Heredity in rabbits and guinea pigs. Bibliographia Genetica 1: 418-452. 24 fig. Martinus Nijhoff: The Hague, 1924.—This is a discussion of the known hereditary characters of rabbits and guinea pigs. The parallelism which exists between the inherited characters of the 2 species is pointed out. Notes are included on the origin of domestic rodents and the history of heredity in the 2 species.—*H. C. McPhee.*

3553. CHRISTOPH, KARL. Untersuchungen an *Dactylis glomerata* L., *Lolium perenne* L. und *Avena elatior* L. [Investigations on *Dactylis glomerata* L., *Lolium perenne* L. and *Avena elatior* L.] Zeitschr. Pflanzenzücht. 10: 311-383. 1925.—In these 3 grasses, the proportion of the total dry weight of the plant was determined and chemical analyses were made at different stages of growth, for the basal leaves, upper stem leaves, stem, and inflorescence. Based on the results obtained, suggestions are given the plant breeder regarding plant types to be selected in breeding for improved pasture and meadow grasses.—*W. A. Carver.*

3554. CHURCH, A. E. R. On the moments of the distribution of squared standard-deviations for samples of N drawn from an indefinitely large population. Biometrika 17: 79-83. 1925.—The author derives the 1st 4 moments for samples from any form of distribution by extension of "Student's" method.—*J. R. Miner.*

3555. COOK, M. T. Sugar cane seed selection. Seed cane and cane disease. Facts about Sugar 20: 138. 1925.—Emphasis is placed on the value of selecting seed cane for planting purposes, especially in the control of mosaic disease. The author holds that the best cane of the plantation should be used for seed and that poor or stunted cane should never be used for planting even when apparently free from known diseases. *Marasmius plicatus* and various species of *Rhizoctonia* and *Pythium*, and also *Melanconium sacchari* Mass. and *Colletotrichum falcatum* Went. are mentioned in connection with the matter of seed selection, but definite evidence of their transmission through seed is lacking. However, *Plasmodiophora vascularum* Matz and *Bacterium vascularum* E. F. S., causing diseases of sugar cane in Porto

Rico, are known to be transmitted by seed cane, and due precaution is advised. The best cane is of far more value for seed than for grinding.—*H. P. Agee.*

3556. COULTER, J. M. The present status of evolution (the botanist's view). Trans. Illinois State Acad. Sci. 16: 29-36. 1923.—The theory of the inheritance of acquired characters has again come into notice as testimony of the inheritance of such characters in both plants and animals has been secured. The theory of natural selection is under critical examination. The original example of mutation, *Oenothera lamarckiana*, has turned out to be probably a hybrid and not a genuine case of mutation. The mutation theory is now questioned since the genetical study of evolution has shown that most mutants are degenerates—the majority worse than their parents and none of them better. Hybridization as responsible for evolution encounters the objection that hybrids are mixtures but that nothing new is introduced. At the present time attention is being focused on the experimental study of inheritance which has shown how complex a problem evolution is. More exact experimental evidence must be forthcoming before much further progress can be made in solving the problem of evolution.—*Charlotte Elliott.*

3557. CUTLER, IRA EUGENE. A study in atavistic heredity. Jour. Heredity 16: 252-256. 4 illus. 1925.—The peculiar variety of fowls in question, Creepers, Dumfries or Brevecrows, has been known for hundreds of years, along with the Rumpless, Frizzles, Silkies and the like, but no one seems to have noticed the abnormalities lying in the appendages, wings and legs. In both cases the bones are all much shortened; but in the leg, while all the bones are much shortened, in the orus or "drumstick" we find 2 complete bones. In normal fowls, there is 1 bone, the tibia, with a small splint, the fibula. In old specimens these members are strongly ankylosed, especially in the distal portion. In the unequal lengthening of these, the tibia becomes bent forward and thickened. This complete development of the fibula is surely of low reptilian type. Genetically, when these fowls are crossed with normal ones, about 50% will come true to type. When bred *inter se*, some chicks show this abnormality, making walking absolutely impossible. Here we have a lacterilian rather than a dinosaurian characteristic. It is practically impossible to breed such individuals, so nothing can be said about their progeny. It is possible that some new, retrogressive features might develop. It is commonly held that birds sprang from a reptilian stem, probably an offshoot of the Dinosaurs. These facts may throw some light on this problem.—*Author.*

3558. DAVID, P. A. A study of inheritance in tobacco crosses involving native and imported varieties. Philippine Agric. 14: 3-35. 1925.—The segregation in crosses of native and imported varieties of tobacco in the 2nd generation is recorded for age of flowering, height of plant, number of leaves per plant and the arrangement of leaves on the plant. The individuals are classified into groups and the numbers in these groups are compared with various Mendelian ratios. The number of factors involved in the inheritance of the number of leaves per plant is from 1 to 3.—*D. F. Jones.*

3559. DELAND, F. Hereditary impairment of hearing. Jour. Heredity 16: 141-144. 1 illus. 1925.—A. G. Bell's studies of inheritance of deafness are reviewed, and the apparent correlation between deafness and other sense defects is noted.—*Robert Cook.*

3560. DETJEN, L. R. A peloric violet (*V. primulaefolia*, L.). Jour. Heredity 16: 386-390. 4 fig. 1925.—This is a description of a peloric violet (*Viola primulaefolia* L.) discovered in 1912 near Raleigh, North Carolina, earlier noted in *Torrey* 20^s: 1920, together with observations on the behavior of its progeny in 3 succeeding seminal generations when self-fertilized. The author describes the peloric form, placing especial emphasis on the uniformly 4-merous floral whorls as contrasted with the odd numbered and irregular whorls of the normal type. The presence of a host of intermediate flower types is noted and their departure from the normal described. The plants grown under diverse environmental conditions continued to breed true to type whether propagated vegetatively or by means of seeds. This behavior of the plants leads the author to consider the strain to be a true mutation, and probably representing a type midway between the normal irregular species and some long lost regular flowered prototype.—*Author.*

3561. DUNN, L. C. The inheritance of rumplessness in the domestic fowl. Jour. Heredity 16: 127-134. 4 illus. 1925.—Rumpless fowls have been known for a long time and even

rumpled breeds have been recognized. In addition to this heritable type of rumpleness, occasional rumpled fowls appear in normal flocks. While these "accidental" rumpled are morphologically indistinguishable from the genetic type, the rumpled condition is not inherited. Genetic rumpleness is evidently a simple dominant character. As no satisfactory evidence was obtained of the existence of homozygous rumpled fowls, it is possible that the character is lethal in the homozygous condition.—*Robert Cook.*

3562. FICK, R. Bemerkungen zur "Antwort" des Herrn Belar. [Remarks on the reply of Professor Belar.] *Naturwissenschaften* 13: 723-724. 1925.—The object of the author in his early article was to suggest modifications to the then prevalent theory of inheritance. He calls upon the reader of his own and of Belar's articles to draw their own conclusions regarding the need of the suggested changes. He criticizes his opponent's interpretation of his views on chromosome individuality and chromosome pairing. He is not convinced by the arguments of Belar, supporting the chromosome theory of inheritance, and cites in opposition the work of Aebly who explains Mendelian segregation by means of a reversible chemical process.—*A. E. Longley.*

3563. FISK, EMMA L. The chromosomes of *Zea Mays*. *Proc. Nation. Acad. Sci.* [Washington, D. C.] 11: 352-356. 7 fig. 1925.—The somatic chromosome number in many varieties of *Zea Mays* was found to be 20. Stages in microsporogenesis were found more favorable than somatic mitoses for detecting differences in the size and shape of the bivalent chromosomes. In the more advanced stages of diakinesis, gemini take on their characteristic shapes in which their specific identity is most marked.—In the Black Mexican variety of sweet corn somatic chromosome counts varying from 20 to 30 were made, but this variety is exceptional with respect to chromosome number; diakinesis showed 8-11 chromosome pairs and other bodies which might be univalents. These bodies occurred occasionally in Golden Bantam sweet corn and 1 case was found in a flint corn.—*A. E. Longley.*

3564. FRETS, G. P. Over de erfelijkheid van der oogkleur. [Heredity of eye color.] *Genetica* 7: 65-86. 1925.—The author found in his material, as have many other investigators, more females than males with the non-blue eye color. No case was met with where both parents were blue eyed and any of the children non-blue eyed (Hurst, Davenport, Waardenburg). In the author's material, families occurred in which 1 or both parents had the yellow color only slightly developed, whereas among the children there are more with yellow and also orange color in the central part of the iris. The cases of Bryn and of Winge also include families where the brown eye color of the children surrounds the pupil. Therefore the author is not convinced as yet that genotypically blue eyed parents can have non-blue eyed children. The results of the cross blue \times non-blue and the reciprocal cross non-blue \times blue may decide if the appearance of more brown eyed females than males rests on some process of selection (greater fertility of brown eyed mothers, greater mortality of blue eyed females) or on the heredity of the eye color. When the results of these crosses differ, there is sex linked or sex limited heredity. The results of Winge do not agree with those of DeCandolle and of the author. It is important that more material on eye color should be gathered and that notice be taken of very small quantities of yellow and brown color.—*Author's summary (transl. by S. J. Wellensiek).*

3565. FRISCH, R. Recurrence formulae for the moments of the point binomial. *Biometrika* 17: 165-171. 1925.—The author derives a system of recurrence formulae, of which Pearson's is a special case, and extends Pearson's and Romanovsky's formulae to incomplete moments.—*J. R. Miner.*

3566. FROST, HOWARD B. Tetraploidy in Citrus. *Proc. Nation. Acad. Sci.* [Washington, D. C.] 11: 535-537. 3 fig. 1925.—In a stout, slow-growing, thick-leaved seedling form of sweet orange (*C. sinensis* Osbeck), evidently produced apogamically, there are 18 pairs of chromosomes, instead of 9 as in the parent variety and its normal apogamic progeny. At the 1st division in the pollen mother cells the bivalents often unite or approach to form quadrivalent groups. The variable count at the 2nd metaphase indicates very frequent non-disjunction. Microcytes occur very frequently. The pollen mother cells and pollen tetrads are larger than in diploid trees. Similar thick-leaved apogamic forms, presumably tetraploid, have been produced by 11 other horticultural varieties. Four species are concerned

altogether. Thick-leaved seedlings occur frequently, often coming from the same seed as normal apogamic seedlings. Evidently tetraploidy originates frequently in nucellar tissue or in very young embryos.—*Author*.

3567. GEYR, H. BARON. *Larix eurolepis*, Henry. *Zeitschr. Forst- u. Jagdw.* 56: 240-242. 1924.—A hybrid was produced near Dunkeld, Scotland, from seed of Japanese larch (*L. leptolepis*) fertilized by pollen from the European species (*L. europeae*). The process is not reversible. The Japanese tree produces only hybrids, the European species only offspring true to type. The hybrid has taxonomic characters of both parents, and the F_1 trees are very uniform. In growth it surpasses both parents. In 1 plantation, *L. eurolepis* trees planted 6 feet apart were of mine-prop size in 7 years. Henry also noted that the Dunkeld larch, besides its remarkable growth, was remarkably healthy, being free of plant lice and fungous diseases. The only explanation so far offered for hybridizing in 1 direction is that the ♀ flowers of the 10 *L. leptolepis* are receptive only for *L. europeae* pollen, while the *L. leptolepis* pollen is not suited to the corresponding pistillate flowers. Experiments with this tree in Schleswig-Holstein are recommended.—*J. Roeser*.

3568. GOTOH, KAZUO. Ueber die Chromosomenzahl von *Secale cereale* L. [Chromosome-number in *Secale cereale* L.] *Bot. Mag. Tôkyô* 38: 135-151. 13 fig. 1924.—Among rye plants, there are, besides the typical 7-chromosome individuals, sometimes plants with 8 or 16 chromosomes. In those with 8 chromosomes are found 2 homologous chromosomes in the hetero- and homotypic nuclear division of the pollen mother-cells, and these very often differ in many respects from the other 14. The investigations have shown that the 8-chromosome rye originates from the 7-chromosome. Sometimes 2 of the 14 chromosomes of the latter will divide diagonally, thus accounting for the 2 extra chromosomes under discussion.—(Courtesy Japanese Jour. Bot.). Transl. by Catherine S. Van Brunt.

3569. GRIFFEE, FRED. Correlated inheritance of botanical characters in barley, and manner of reaction to *Helminthosporium sativum*. *Jour. Agric. Res.* 30: 915-935. 2 pl. 1 fig. 1925.—A cytological study of the cultivated species, *Hordeum vulgare*, *H. distichon*, *H. intermedium* and *H. deficiens* showed each to have 14 chromosomes in the somatic cells. Inheritance of black vs. (versus) white grain and 6-rowed vs. *deficiens* was studied in the cross, *H. deficiens stendelii* × Manchuria. The inheritance of white grain vs. black, 2-rowed vs. 6-rowed, rough vs. smooth awns and resistance to *Helminthosporium sativum* vs. susceptibility to this organism were studied in the cross, Svanhals × Lion. Each of the character pairs, 2-rowed vs. 6-rowed, black grain vs. white, and early heading vs. late heading, were found to be differentiated by a single factor. In the cross, Svanhals × Lion, the parent varieties were found to differ in 2 factors for the development of barbs on the awns. Factor *R* alone or with *S* gave rough awns. Factor *S* in the absence of *R* produced intermediate smooth awns. In the absence of *R* and *S* the awns were smooth like those of the smooth awned parent. The results suggested other factors which modified the degree of smoothness of the awn to a slight degree. Resistance and susceptibility to *Helminthosporium sativum* in the cross Svanhals × Lion were differentiated by at least 3 factors. The character pairs, 2-rowed vs. 6-rowed, black vs. white, rough awned vs. smooth, and intermediate smooth vs. smooth awn, appeared to be independent in inheritance. Early heading and the 6-rowed condition appeared to be linked with 42% crossing over. The characters, white grain, 6-rowed and rough awns, were associated with resistance to *Helminthosporium sativum* in the parent, Svanhals, of the cross, Svanhals × Lion, and the allelomorphs in the other parent. In a study of 135 F_3 families of this cross, 2-rowed lines averaged higher in resistance than 6-rowed lines, white grained lines higher than black grained and rough awned lines higher than smooth awned lines. The facts indicate a linkage of the factors concerned with the development of resistance to this pathogen and the factors for the characters with which they were associated in the parent Svanhals. The linkage cannot be very intense since all combinations seem possible. The results of these studies indicate 4 linkage groups.—*Author*.

3570. GRIFFITH, J. P. The Queensland raspberry (*Rubus probus*). *Jour. Heredity* 16: 328-334. 4 illus. 1925.—An account is given of a hybrid raspberry (*Rubus ellipticus* × *R. probus*), originating near Queensland, Australia, suited to cultivation in tropical lowlands. It was introduced into Porto Rico in 1912 by the U. S. Dept. of Agriculture. The Queens-

land raspberry is much more productive, vigorous and disease-free than the wild raspberry (*R. rosaeifolius*) in Porto Rico. The horticultural characters of *Rubus probus* are discussed and its possible merit as a good pistillate stock for breeding purposes in other tropical regions is pointed out. The northern Cuthbert raspberry has been successfully crossed with the Queensland berry as a pistillate parent. The importance of sulphuric acid as an aid in germinating *Rubus* seed is mentioned. The introduction to Porto Rico of *Rubus* spp. from the U. S. A. and from other countries and the behavior of some of them are discussed.—*Author*.

3571. HAGIWARA, T. Genetic studies of leaf-characters in morning glories II. On the relation between "Rangikuba" and "Tatutaba." (Japanese.) Bot. Mag. Tôkyô. 39: (77)-(97). 1925.—The genetic formula for "Namiba" (normal leaf) is *KHIM*. "Maruba" (heart shaped leaf) may be represented by the formula *KhIM* and *khIM*. "Tomboba" (dragonfly leaf) is *khIM*. "Rangikuba" (irregularly lobed leaf) may be represented by *khiM*, *KhIM* or *KHiM*. "Tatutaba" (maple-like leaf) is *KHIm*. Combination forms are "Tombo-Tatutaba" (*kHIm*), "Tombo-Rangikuba" (*kHiM*), "Maru-Tatutaba" (*KhIm* and *khIm*), "Tatutaba-Rangikuba" (*KHim* and *khIm*). The types *Khim* and *khim* are still unknown. "Tatutaba-Rangikuba" has narrow lobes and resembles a feather and its flower is similar to the so-called "Shishizaki" but is fertilized with difficulty.—*K. Ichijima*.

3572. HAGIWARA, T. Genetic studies of leaf-characters in morning glories. III. On the relation between "Nantenba" and "Kujakuba." (Japanese.) Bot. Mag. Tôkyô. 39: (187)-(197). 1925.—"Nantenba" is a variety having leaves like the poison ivy where the margins roll back, and behaving as a simple Mendelian recessive to the normal. The factor (*n_a*) for this leaf produces effects on every part of the plant. In the "Kujakuba" variety the leaf shape (*p*) resembles the leaf of sweet potato. This character behaves not only as a recessive to the normal leaf, but also to shapes "Tatutaba" (*m*) and "Tomboba" (*k*), respectively. The leaf which the Japanese gardener calls "Takaraminoba," on account of its thread-like shape, may be described as being due to the presence of 4 recessive factors or *p*, *m*, *n_a* and the *s_a* factor previously described for the "Sasa" variety.—*K. Ichijima*.

3573. HANSEN, W. Die Vererbungsnachweise in der Mahndorfer Pflanzenzücht. [Information on inheritance from the plant breeding operations at Mahndorf.] Zeitschr. Pflanzenzücht. 10: 25-31. 1924.—In the course of practical plant breeding operations with cereals and peas at Mahndorf (near Halberstadt, Germany) many observations on inheritance are made, although inheritance studies as such cannot be pursued. The characters of the better strains, the only ones retained, give certain indications regarding characters of value in selection. Considerable discussion of different characters and objectives of selection operations are given.—*C. E. Leighty*.

3574. HEUSSER, C. Hevea-Selectie. [Hevea-selection.] Mededeel. Alg. Proefsta. A. V.R.O.S. Rubberser. 41. (Reprint Rubberecult. 87: Dutch and English texts). 1-54. 1924.—The author points out the aim and object of selection in Hevea. This can be accomplished through vegetative selection and through generative selection. Mendelian inheritance is discussed and its application to the Hevea problem is pointed out. Vegetative offspring from known and desirable mother trees in the main show the desirable characteristics of the mother tree. There are some, however, that are undesirable. Generative offspring from trees of controlled pollination are not yet old enough to tap.—*Cecil Yampolsky*.

3575. HUGHES-SCHRADER, SALLY. Cytology of hermaphroditism in *Icerya purchasi* (Coccidae). Zeitschr. Wiss. Biol. Abt. B. Zeitschr. Zellforsch.- u. Mikrosk. Anat. 2: 264-292. 4 pl. 1925.—The almost entire absence of males in this species and the production of offspring from virgin females do not necessarily imply parthenogenesis. Cytological investigation reveals the fact that all of the apparent females are in reality functional hermaphrodites—the only entirely authenticated case in the insects. Every egg must be fertilized by a spermatozoon before it can develop. In the vast majority of cases spermatozoa are furnished by the animals' own testes. When males are present, copulations occur, in which a few of the offspring may become males. The spermatozoa of the males are probably ♂-producing, those developed in the hermaphrodites themselves are ♀-producing. The hermaphrodites are homozygous for sex, as is shown by the fact that the sperms which they produce have the same genetical constitution as the eggs, so that self-fertilized eggs give rise only to hermaph-

rodites. The morphology and histology of the hermaphroditic gonad is described for each of the nymphal and adult instars. The eggs undergo a normal maturation, the diploid chromosome number being 4, and the haploid 2. Many entire spermatozoa enter each egg, 1 of which fuses with the ♀ pronucleus, the rest forming in the cytoplasm nuclei with the haploid chromosome number. These disintegrate immediately after the fusion of ♂ and ♀ pronuclei. There is no recognizable difference between the process of oögenesis in the eggs of self-fertilized hermaphrodites and those of cross-fertilized ones, nor is there any difference between spermatogenesis in the testes of males and hermaphrodites. This work emphasizes the danger of regarding unbalanced sex ratios, or the production of offspring in the total absence of males, as evidence for parthenogenesis in the insects.—*Ralph E. Cleland.*

3576. HUSKINS, C. L., AND J. R. FRYER. The origin of false wild oats. *Sci. Agric.* 6: 1-13. 1925.—The literature, which is extensively reviewed, shows that false wild oats do not originate from natural crossing between *Avena sativa* and *A. fatua*, but from a spontaneous change in a gamete of *A. sativa*. Such a gamete will usually mate with a normal one and give rise to the heterozygous false wild type. This then segregates to give the pure variety, heterozygous false wild, and homozygous false wild in the ratio of 1:2:1. Cytological evidence, to be reported later, indicates that the original change is due to irregular chromosome behavior similar to that by which Winge has accounted for speltoid forms of wheat.—*W. P. Thompson.*

3577. IMAI, Y. Genetic studies in morning glories. XV. On the ever-sporting behavior of the cream flower in *Pharibitis Nil*. (Japanese.) *Bot. Mag. Tôkyô.* 39: (43)-(52). 1925.—A pure race, "115," bears cream flowers, the cream flower recessive to colored and giving out ever-sportingly some colored plants (about 6% of the total). This percentage varies, however, in the hybrid progeny. Thus there may be 1 or more modifiers which influence the ratio of the sports. Six such sports were tested; all proved to be heterozygotes. The colored sports, therefore, may be considered to be the result of the mutation from recessive to dominant. The mutation is assumed to take place, at least in the majority of the cases, at the formation of the gametes. The segregating ratio of the coloreds and creams is approximately 3:1. This may probably be attributed to the influence of the mutating gametes. On the hypocotyl of the cream seedlings 1 or more colored stripes frequently appear. The extent of such striping varies. The stripe disappears on the stem above the cotyledons. The degree of the occurrence of the striped stem varies in the different pedigrees. The cream flower in rare cases bears a striped flower, or less frequently even an entirely colored one.—*K. Ichijima.*

3578. IRMSCHER, EDGAR. Ueber eine Abänderung des Zahlenverhältnisses zwischen männlichen und weiblichen Blüten bei der monoecischen *Begonia Wallichiana*. [Variation in the ratio of male to female flowers in the monoecious *Begonia Wallichiana*.] *Mitteil. Inst. Allg. Bot. Hamburg* 6: 149-158. 15 fig. 1924.—In the inflorescence of *Begonia Wallichiana* the number of flowers and the ratio of the ♂ to ♀ flowers are sharply fixed. Moreover, the ♂ and ♀ flowers each have a separately developed perianth. These can be regarded as secondary sex characteristics. In 1 plant the inflorescences deviated fundamentally from the normal behavior. Pure fertile ♀ flowers arose from flower anlagen originally pure ♂. Thereby, the primary ratio of the flowers in the inflorescence shifted from 3♂:1♀ to 2♂:2♀. But those second ♀ flowers, arising in the place of a ♂, have the perianth characteristics of a ♂ flower. Thus a whole new ♀ flower form arose.—*Author (transl. by Catherine S. Van Brunt).*

3579. IRWIN, J. O. The further theory of Francis Galton's individual difference problem. *Biometrika* 17: 100-128. 1925.—The author derives (1) mean difference between p^{th} and q^{th} individuals in order of magnitude of a given character, (2) moments of frequency distribution of differences between consecutive individuals, (3) actual frequency distribution for samples of 2 and 3. Frequency distribution of differences between pairs of individuals taken at random from a normal population is the normal curve whose standard deviation is $\sqrt{2} \times$ the standard deviation of the original population. Frequency distributions of differences for any size of sample are well fitted with tail of normal curve. The author discusses the application of this method to fraternal correlations.—*J. R. Miner.*

3580. JONES, D. F., AND P. C. MANGELSDORF. The improvement of naturally cross pol-

minated plants by selection in self-fertilized lines. I. The production of inbred strains of corn. Connecticut [New Haven] Agric. Exp. Sta. Bull. 266. 347-418. 1925.—An extended review of literature summarizes the development of method of selection in self-fertilized lines. Four varieties of corn self-fertilized and selected for 5 generations gave 86 lines, 20 of which were lost or discarded. The method of procedure is given and a large number of appearing recessive abnormalities are described. The behavior of several of the lines is shown diagrammatically and graphically. Some of the conclusions pointed out are, 1st, that there is no single criterion by which high yielding strains can be obtained; 2nd, selection during inbreeding and segregation with elimination of heterozygous combinations for a particular character as tallness or resistance to smut is somewhat effective; 3rd, the yield of grain shows no such simple relation. High yielding strains may come from plants which are poor producers, and very unpromising strains during the early years may be very productive later, or the reverse. The final conclusion is that effective selection must be based upon performance of the plants after homozygosity is attained.—Henry Dorsey.

3581. KELLOG, V. L. Variations and mutations. Sci. Monthly 21: 136-137. 1925.—Variations are of 2 kinds, fluctuating and inheritable. The latter are concerned in species formation and in evolution, and have been found particularly in the fruit-flies and in the evening primrose.—L. R. Waldron.

3582. KNIEP, H. Über erbliche Änderung von Geschlechtsfaktoren bei Pilzen. [On hereditary changes of sex factors in fungi.] Zeitschr. Indukt. Abstamm.- u. Vererb. 31: 170-183. 1923.—In haplodioecious Hymenomycetes the formation of clamp-connections follows the pairing of single-spore mycelia, and is the criterion of sexual reaction. This is an indication of genotypic differences, whereby it is possible to test the factorial composition of haplonts. Since sexual reaction occurs only between haplonts differing in 2 sex factors, dihybrid ratios are obtained from crosses. In *Schizophyllum commune*, haplonts with expected factorial compositions may be recovered from diplonts of known origin; and in addition, some which have mutated in one or the other of the sex factors. Two haplonts, having each a mutated gene, of the 1st and 2nd sex factor respectively, were crossed and produced a fruiting body. From this, 25 single-spore mycelia were back-crossed to the 4 original (non-mutated) haplont types. Seven of these (expectation $\frac{1}{4}$) gave reactions with all 4 non-mutated haplonts, indicating that these 7 contained both mutated factors. Microscopic control of cultures to prevent errors due to accidental formation of diploid mycelia is described.—J. Lincoln Cartledge.

3583. KVAKAN, PAUL. Heritable characters in maize. XXIV. Twisted seedlings. Jour. Heredity 16: 427-430. 3 fig. 1925.—A morphological abnormality called "twisted" is described. Three genetically distinct "twisted" are demonstrated.—R. A. Emerson.

3584. KYLE, CURTIS H., AND HUGO F. STONEBERG. Associations between number of kernel rows, productiveness and deleterious characters in corn. Jour. Agric. Res. 31: 83-99. 1925.—Commercial varieties of corn that had been selected for more than 1 ear per plant were shown to yield more than those selected for 1 ear of relatively large size. Apparently the yield difference was due to a larger percentage of barren plants from the 1 ear or nonprolific selections. The 2 classes, in addition to differing in number of ears per plant, size of ears, and yield, also differed in number of rows of kernels on the ears and in size and angularity of the kernels. Differences in these characters were studied in connection with yield by using representative groups of seed ears within both prolific and nonprolific varieties and within a number of F_1 varietal crosses, and it was found that the characters corresponding to those of the prolific varieties were associated with the higher yields. These ear and kernel characters also appeared to be associated so that the selection of any 1 in a given direction, without regard to the others, consistently modified the others in a definite way. Selections were then made within self-fertilized lines until strains were established differing in the number of rows of kernels on the ears. Outside of the preference given to vigor and stability, the selection was confined to the different number of rows. At the end of the selection period the strains with the lower number of kernel rows were most like the prolific varieties in type, having more ears per plant, smaller ears, smoother and more rounded kernels and a greater yield per acre than the strains with the higher numbers of kernel rows which were most like the nonprolific

varieties. Furthermore, this last class showed more of the deleterious class of characters, such as plaited and erect leaves, entangled leaves, chlorophyll blotch, premature dying, smut and barrenness, which probably accounts for the relatively low production.—*C. H. Kyle.*

3585. LESAGE, PIERRE. Extension du caractère acquis et faits d'hérédité dans le *Lepidium sativum* arrosé à l'eau salée. [The extent of acquired character and cases of heredity in *Lepidium sativum* watered with salt water.] Compt. Rend. Acad. Sci. Paris 180: 854-855. 1925.—Abnormal fruits with 3 or 4 wings are more numerous on plants watered with salt water than with fresh water. Such abnormal fruits are still more numerous on plants from seed formed in abnormal fruits. The seed of salted plants are shorter and more round than the checks. This acquired seed character is transmitted through the 2nd and 3rd generations without salt water. These 2 characters of abnormal fruit and round seed become increasingly evident with succeeding generations of salted plants and lead to the hope that these characters will become clearly established and that other modifications as yet scarcely evident may increase in the following years.—*Charlotte Elliott.*

3586. LESAGE, PIERRE. Sur l'hérédité du caractère précocité et sur la conservation de ce caractère dans les graines âgées. [The heredity of a precocious character and the retention of this character by old seed.] Compt. Rend. Acad. Sci. Paris 180: 1604-1605. 1925.—The author found that seed of *Lepidium sativum* matured under glass produces plants which grow more rapidly than the plants from seed matured in the open air. By means of tabular results he shows that this character of more rapid growth is inherited to the 4th generation in the open air without any signs of decreasing. Seed matured under glass and planted after 2, 4, 6, and 7 years in the open air still manifest this precocious character.—*Charlotte Elliott.*

3587. LINDSTROM, E. W. Heritable characters of maize. XXI—Teopod. Jour. Heredity 16: 135-140. 2 illus. 1925.—A dominant mutation is described, which has 2 outstanding characteristics: (1) Extremely narrow leaves, suckering habit of growth, and wax on stalks, like teosinte; (2) kernels covered with long glumes like pod corn. The lower flowers are often completely sterile. Teopod behaves as a simple dominant in inheritance.—*Robert Cook.*

3588. LOEB, L. The mechanism of the sexual cycle and the specificity of growth substances. Soc. Exp. Biol. and Med. Proc. 20: 443-445. 1923.—The following classification of the period of the sexual cycle is proposed: I. Follicular phase: (a) Prooestrus—when conditions are dominated by an ovarian factor other than the corpus luteum, probably by the maturing follicles the walls of which secrete a substance which causes various kinds of circulatory changes and growth processes and in addition certain psychological alterations. Proliferation, influenced by this substance, occurs in the mammary gland, the vagina and the uterine wall and this substance calls forth changes in the ovary which culminate in ovulation. (b) Oestrus—these growth processes usually cease suddenly in the vagina but in the mammary gland they may continue for a short time. (c) Metoestrus (in some cases).—II. Intermediate phase—following ovulation preceding sensitization of the uterus, when the 1st substance has ceased to act and the 2nd has not yet become effective.—III. Lutein phase. (a) Period of sensitization of the uterus. Ovulation leads to the formation of the corpus luteum and the substances given off by it dominate this phase. Sensitization of the uterus by the substance makes possible all the changes that occur in the uterus, cause growth processes in the mammary gland and prevent prooestrus, oestrus and ovulation. Corpus luteum substance does not prevent the maturation of the follicles. Sensitization of the uterine wall is limited to the (a) 1st half of the life of the corpus luteum; (b) period of return to resting state; (c) period of resting state.—*Robert T. Hance.*

3589. LONGLEY, A. E. Segregation of carbohydrates in maize pollen. Science 61: 542-543. 1925.—Several investigators have found a visible segregation in maize pollen. The writer corroborates this discovery by finding that pollen of plants heterozygous for *Wx* can be differentiated into starchy and waxy groups with a dilute solution of iodine. Kuwada has reported maize forms with other than 10 haploid chromosomes. The writer has found 4 strains, 2 sweet and 2 starchy, in which supernumerary chromosomes occur.—*Author.*

3590. MAYER-ALBERT, MARIA. Vergleichende Untersuchungen über den Blattbau einiger *Solanum*-Pfropfbastarde. [Comparative investigations on the leaf structure of some *Solanum* graft hybrids.] (Dissertation, Hamburg Univ.) Mitteil. Inst. Allg. Bot. Hamburg.

6: 1-32. 4 pl. 1924.—These investigations include the parent species, *Solanum nigrum* and *S. lycopersicum*, and the graft hybrids, *S. tubigense*, *S. Koelreuterianum* and *S. proteus*. The cells of both parent species concerned in the formation of the chimera are compatible. Each cell reveals its origin most clearly by characteristics common to it and its parent. Therefore certain variations of the parental cell characteristics are established here and there in the graft hybrids. In other respects their histological construction is in perfect accordance with the interpretation of *S. tubigense* as a monochlamydous periclinal chimera with an outer layer of *S. nigrum*, with the interpretation of *S. Koelreuterianum* as the graft hybrid reciprocal to it, and of *S. proteus* as a diplochlamydous periclinal chimera with a 2-layered sheath of *S. lycopersicum* outside of the vegetation point.—*M. Christiansen (transl. by Catherine Van Brunt)*.

3591. MELLON, RALPH R. Studies in microbic heredity. I. Observations on a primitive form of sexuality (zygo-spore formation) in the colon-typhoid group. Jour. Bact. 10: 481-501. 5 pl. 1925.—It has been shown among members of the colon-typhoid and diphtheria groups of bacteria that all stages of a process can be traced, which parallels in its morphological details what is known as isogamic conjugation or zygosporic formation, such as has been proved in recent years to occur with many of the yeasts. These zygosporic, erroneously known as involution forms, will germinate under the proper conditions. Their germination, and its direction as well, depends primarily on the extent to which they have been differentiated by the action of certain saturating environmental influences of which bacteriolysis appears to be but one. When the new environmental conditions are suitable for germination of these zygosporic, their descendants may be seen to have acquired new characters, or perhaps to have had latent ones rejuvenated. The fact that the acquisition of virulence has been associated with the cyclic development of such new races suggests a most important bearing on many questions of infection and immunity. Under certain conditions, then, this process may become a mechanism for the dissociation of the pleomorphic cycle as it naturally occurs in the life history of all organisms, and forces us to regard bacterial pleomorphism in the same way in which we regard it among the fungi. Variation within pure lines of bacteria is thus for the 1st time given botanical correlation through the medium of a special evolutionary stage in their life history.—*Author's summary*.

3592. MOL, W. E. DE. Het celkundig-erfelijk onderzoek in dienst gesteld van de veredeling der hyacinten, narcissen en tulpen. [Cytological and genetic research applied to the improvement of hyacinths, narcissuses and tulips.] Genetica 7: 111-118. 1925.—The author has not been able to cause hereditary variation in the structure of the somatic nuclei in the diploid and heteroploid varieties of *Hyacinthus orientalis*, but only slackening in growth and weakening of the plants. Tetraploid somatic varieties have sprung from diploid hybrids between *Narcissus pseudonarcissus* and *N. poeticus*. Such varieties may be used in obtaining triploid varieties of *N. poeticus*, which until now were not present in the Dutch cultures. In similar environment it appears possible to cause duplication of masculine sexual nuclei in robust heteroploid as well as in smaller diploid varieties of *Hyacinthus orientalis* and in *Bellevalia*; not in *Tulipa Gesneriana* and *Narcissus poeticus*. In extremely rare cases diploid pollen grains arise in *Tulipa Gesneriana*. By the reaction of thus far insufficiently known external influences the triploid *Tulipa Gesneriana* var. Pink Beauty appears to be able to form viable seed without pollination. Heteroploidy has been observed in the cultures of *Tulipa Gesneriana* in Holland. It is found there in the same stadium as *Hyacinthus orientalis* in 1875 and as *Narcissus pseudonarcissus* in 1900. The occurrence of heteroploidy in tulip cultures may perhaps help to clear up the difficulties in explaining the origin of thief tulips. In *Tulipa silvestris* and in *T. Gesneriana* the chromosomes are the same in shape and bulk. In comparison to *Tulipa Gesneriana*, *T. silvestris* is tetraploid or hypotetraploid. *Euhycanthus*, *Eutulipa* and *Eunarcissus* each represent a syngameon (Lotsy) and a karyotypus (Delaanay).—*Author's summary (transl. by S. J. Wellensiek)*.

3593. MOREAU, F., ET A. DUSSEAU. Étude biométrique de quelques blés de la famille du Gros bleu. [Biometric study of wheats of the family Gros bleu.] Bull. Soc. Bot. France. 72: 132-139. Fig. 1-4. 1925.—These experiments were carried on at the Station de Selection du Massif Central. The wheat called "Gros bleu" holds a very important place in the gene-

alogy of wheats of recent high yield. The authors compared the curves of variation of different fluctuating characters—the number of spikelets, length of stalk, number of grains and weight of grain per head in the Gros bleu and its progeny. The latter are: Hybride inversable, H. de la Paix, H. du trésor, Bon fermier. Pedigrees of these wheats were used for this comparison. The curves of variation of all these varieties show resemblance to each other and to the parent. Gros bleu and Blé du trésor are particularly closely related. The comparison of the curves shows the superiority of the hybride de la Paix. This wheat from another locality was particularly resistant to lodging and Beauverie has shown that it was more resistant than any other wheat to a severe epidemic (1923) of yellow rust (*P. glumarum*). It is, then, an excellent acquisition for agriculture.—*J. Beauverie (transl. by Mary Ellen Peck.)*

3594. PERRIN, O. *L'amélioration des céréales par l'hybridation.* [The improvement of cereals by hybridizing.] Ann. Agric. Suisse. 26: 35–58. 1925.—This is a detailed account of the laws of heredity as applied to cereals and of the technique of crossing and selection in wheat, rye, oats, and barley.—*Charlotte Elliott.*

3595. PUNNETT, R. C. *Lathyrus odoratus.* Bibliographia Genetica 1: 69–80. 2 fig. Martinus Nijhoff: The Hague, 1924.—The genetics of the sweet pea is briefly reviewed. The forms which show Mendelian relations are divided into structural (10) and color (11) characters. Only a few of these show a heterozygote form. These characters appear to fall into 8 linkage groups, which is 1 more than the reported haploid number of chromosomes. The sweet pea produces fertile crosses with *L. hirsutus*, but it is thought that the forms of the sweet pea have originated by mutation from the wild form and not by inter-species hybridization. The wild form is regarded as containing all the dominant forms known in the commercial sweet pea.—*J. L. Collins.*

3596. RICHARDS, MILDRED H., AND ESTHER Y. FURROW. *The eye and optic tract in normal and "eyeless" Drosophila.* Biol. Bull. 48: 243–258. Pl. 1–3. Fig. 1–9. 1925.—In the mutant "eyeless," the eyes are very small or wanting. The authors compare the histological structure of normal and "eyeless" eyes. In small eyed "eyeless," the 3 normal ganglia are present and ommatidia are normal but greatly reduced in number. In totally eyeless flies the outer ganglion is missing and the other 2 are abnormal. "... observations lend support to the idea that the optic nerve is a mass of fibers connecting the outer and median ganglia."—*C. W. Metz.*

3597. ROBERTS, E., AND R. J. LAIBLE. *Heterosis in pigs.* Jour. Heredity 16: 383–386. 3 illus. 1925.—A litter of pigs from a Duroc Jersey sow sired by a Duroc Jersey boar and by a Poland China boar contained pure bred Duroc Jersey and crossbred pigs. Birthweight of pure bred pigs was 3.23 pounds and that of crossbreds was 3.75 pounds. At 6 months of age the average weight of pure bred was 185.5 pounds while that of crossbreds was 235.2 pounds.—*Author.*

3598. SALAMAN, R. N. *The inheritance of cropping in the potato.* Rept. Proc. Imp. Bot. Conf. London. P. 40–48. 1924.—These studies were begun in 1911 and deal with some 25,000 seedling potatoes representing over 400 families. The author feels that weight of tubers alone is insufficient since it fails to furnish information as to the relationship between the mass of tuber and the mass or area of the foliage. As no satisfactory objective method of measuring this relationship accurately could be devised, a purely subjective method was adopted, which involved eye evaluations in their placement into 5 classes. These classes were as follows: Crop 1, in which the proportion of the tuber mass to the above-ground haulm is very high. Such crops were described as very good. Crop 2, in which the proportion is less, the crop being described as fair or medium. Crop 3 has a still smaller proportion, being described as poor. Crop 4 represents those that sink still further, being characterized as extremely poor. Crop 5, in which there is no tuber formation or at most a few thickened bulbous swellings on the stolons, these plants being designated as 0 croppers. "By plotting the percentages of the number of any individuals in any seedling family which fall into these 5 classes a curve is obtained." By constructing similar curves illustrating actual tuber weights and height of plants it was found as in the case of the 5 classes that repeated cultures from the same family gave similar results. It thus became possible to determine for any

individual a curve representing the crops of its progeny from its own self fertilization. Reciprocal crosses were also found to produce identical results. Numerous curve graphs accompany the article.—*W. Stuart.*

3599. SANDERS, J. *De maandelijksche geboorte.* [The periodicity of births.] *Genetica* 7: 87-96. 1925.—The author criticises the ideas of Wolda who concluded that the periodicity of births in man is dependent only on biologic and climatic influences, just as in birds (*Genetica* 5: 497-526. 1923). He arrived at the conclusion that the periodicity of birth of legitimately 1st-born children in man is dependent on the periodicity of marriage, which, in Holland, may be of 2 types, namely, for municipalities with more than 20,000 inhabitants and for those with less than 20,000. The last type shows a climax in May, which is absent in the 1st one. There is no difference between different municipalities as to the periodicity of birth of non-1st borns. Therefore the endogenous causes influencing the periodicity of birth are the same in towns and in the country.—*S. J. Wellensiek.*

3600. SCHÜRHOFF, P. N. *Das Geschlecht der Pflanze.* [Sex in plants.] *Arch. Pharm.* 263: 376-383. 1925.—The article is a general discussion of sex in plants, particularly in angiosperms. Sex is determined by the chromosome-complex. It may be determined either genotypically or phenotypically. The latter is the more primitive condition; in many instances the phenotypic dominance has become heritable, for example, in ♀ strains with a hermaphroditic chromosome-complex. From such a phenotypic dominance inherited during many generations, a genotypic dominance may apparently be developed by virtue of an irreversible chromosomal modification.—*C. E. Allen.*

3601. SEARLE, G. O. The value of selection work in the improvement of the flax crop. *Rept. Proc. Imp. Bot. Conf. London. P.* 89-93. 1924. [1925].—The fiber flax "J.W.S." shows improved value but difficulties have been found in its increase. Increasing it only for seed without regard to fiber has proved too expensive. Arrangements were finally made with 2 farmers to increase the variety within their limits. For further increase, arrangements were made to develop state-aided organizations. Fiber flax unites, in a rather extreme way, the high cost of manufacture with low yield of seed.—*L. R. Waldron.*

3602. SHAMEL, A. D. Bud selection as applied to the improvement of the smooth cayenne pineapple. *Ann. Short Course Pineapple Prod. Hawaii. Univ. Ext. Serv. Dept.* 4: 123-133. 1925.—A 3rd report upon pineapple bud selection work in Hawaii is given. Remarkable improvements in the amount and commercial quality of crop in the Smooth Cayenne variety through application of bud selection methods have been secured in plantation practise. The increased yield in some test fields due to selection has been found to be as much as 10 tons of fruit per acre or about 100% more than the crop of comparative unselected material. A corresponding improvement in shape, size and other factors of quality of fruits has also been noted in the crops grown from the selected plant material. Bud selection has given immediate results of great economic importance in the pineapple and has been generally adopted by all planters.—*Author.*

3603. SHAMEL, A. D. The improvement of the smooth cayenne pineapple variety through bud selection. *Ann. Short Course Pineapple Prod. Hawaii Univ. Ext. Serv. Dept.* 3: 69-85. 1924.—The pineapple industry in the Territory of Hawaii is based upon the culture of a single variety, Smooth Cayenne. As shown in the report for 1923, p. 116-125, many diverse strains have developed in this variety through the unintentional propagation of bud variations. Many of these strains are undesirable from the canning standpoint. It has been demonstrated in extensive plantation progeny tests that through systematic bud selection work, as described in the preceding report, most of the undesirable strains can be eliminated and that uniformly good strains can be isolated and propagated for commercial planting. The mass selection of propagating material is carried out through marking the selected plants in the best fields before the fruits are harvested, in this way insuring the use of only selected parent plants for propagation. Standards for plant selection, progeny propagation and multiplication are described.—*Author.*

3604. SHAMEL, A. D., C. S. POMEROY, AND R. E. CARYL. Bud selection in the Washington Navel orange. III.—Progeny tests of the Australian strain. *Jour. Heredity* 16: 367-374. 4 illus. 1925.—The Australian strain of the Washington Navel which was formerly common

in California has been almost entirely eliminated from commercial plantings on account of the undesirable character of its fruit and its normal low production. It was doubtless distributed without knowledge of its true character by being propagated on account of the vigorous vegetative development of the trees, before the facts of bud variation were understood and the importance of care in bud selection was appreciated. The data presented indicate that quantity and quality of fruit production are transmissible characters occurring as bud variations and as such are capable of perpetuation through budding.—*C. S. Pomeroy*.

3605. SKAIFE, S. H. **On variation and heredity in the Bruchidae.** Trans. Roy. Soc. South Africa 12: 221-242. *Pl.* 9-11. 1925.—Experimental methods and results are described of work with 3 species of the Bruchidae introduced into South Africa; the common bean weevil, *Acanthosclides obtectus*; the common cowpea weevil, *Callosobruchus chinensis*, and the 4-spotted weevil, *Bruchus quadrimaculatus*. In the common bean weevil a form was discovered which lacks the black pigment characteristic of the normal type. It behaved as a simple recessive to normal. Parallel mutations of the same character were noted for 2 indigenous species of Bruchus. Attempts to establish strains differing in number of spines borne on the underside of the hind femur were unsuccessful and studies of variation in this respect led to the tentative suggestion that it was developmental, not germinal. In the cowpea weevil, evidence was presented for the existence of 2 pairs of factors concerned in the elytral pigmentation, 1 of which governed the presence or absence of black pigmentation and the other its degree of intensity when present. Size and fecundity proved too complex for satisfactory analysis. Attempts to secure interspecific hybrids were unsuccessful.—*R. E. Clausen*.

3606. STURTEVANT, A. H. **An interpretation of orthogenesis.** Science 59: 579-580. 1924.—Mutations in single genes usually produce changes in several characters. If the variation in a given direction in 1 character is associated with variation in a given direction with another character, natural selection operating on 1 of the characters may bring about a change in the other which is not subject to natural selection. An example is given of small bristles in *Drosophila* which are associated with roughened eyes, long development period, and ♀ sterility. Elimination of the sterile females has left the eyes smooth, the growth of larvae at the normal rate and the bristles large.—*D. F. Jones*.

3607. TAKAHASHI, N. **Studies on the inheritance of the spring and winter growing habit in crosses between spring and winter barley.** Bulletin Chosen Agric. Exp. Sta. 2: 1-7. *Pl.* 1-2. 1925.—Barley varieties are arbitrarily classified into 4 groups on the basis of habit of growth as follows: (1) Winter growing habit—varieties which are winter hardy and which fail to ripen when sown in the spring; (2) spring growing habit—varieties which are not winter hardy and which ripen when sown in the spring; (3) intermediate growing habit—varieties which are winter hardy and which will also ripen when sown in the spring; (4) pseudo-winter growing habit—varieties which have the winter habit and fail to ripen when sown in the spring and which are also not winter-hardy. A study was made of the mode of inheritance of winter versus spring habit. In crosses of winter types with spring types, spring habit behaved as a dominant, the F_1 plants exhibiting the spring habit. In the F_2 generation, the ratio was 3 spring habit:1 winter habit. A number of F_2 spring habit plants were tested for breeding behavior in F_3 . The ratio of those breeding true to those segregating was approximately 1:2, as expected. In these crosses the results can be explained on the basis of a single factor difference between the winter and spring habits.—*Fred Griffie*.

3608. THOMPSON, J. McL. **Studies in advancing sterility.** I. Publ. Hartley Bot. Lab. Univ. Liverpool. 1. 1-54. 1924.—The Amherstieae, a type of Caesalpinioideae Leguminosae have been rearranged following a detailed comparison of the developmental morphology of the androecium, as follows.—I. Brownea, Elizabetha, Heterostemon, Macrolobium. These have at initiation 12 stamen-primordia, arranged in a single cycle. The posterior primordium is totally perverted to petaloidy, and becomes the posterior petal. Four others are in part perverted to petaloidy and give rise to 4 petals.—II. Pahudia, Afzelia, Tamarindus. In these, petaloidy arises from similar sources and for similar physiological reasons but at the same time the stamen-potentiality is curtailed with compression and almost elimination of 2 stamen-primordia whose equivalents in series 1 reach fertility. III. Baikiaea, Palovea, Amherstia, Humboldtia. These have entirely lost the 2 stamen-primordia compressed in

series II. The places of these stamens have not, however, been taken by petals. The stamen-cycle is definitely curtailed, so that its full stamen-potentiality is now 10. Petaloidy elsewhere in the flower is as in series I and II.—It is further held that *Crudia*, *Brachystegia*, *Tachygalia*, *Peltogyne*, *Hymenaea*, *Trachylobium*, *Schotia*, *Berlinia*, *Eperua*, *Daniella*, on the grounds of floral structure, are transitional between *Bailiaca* and *Amherstia*.—IV. *Crudia*, *Saraca*. These are held to illustrate the starting point and the final stages, respectively, in the progress of the sterilization-process as it is seen in operation in series III.—This grouping expresses the views of the author as he arranges the whole tribe to show its evolution towards total sterility, by perversion to petaloidy or by the complete inhibition of the primordia of the stamens.—A. E. Longley.

3609. THOMPSON, W. P. Cytological conditions in wheat in relation to the rust problem. *Sci. Agric.* 5: 237-239. 1925.—This is a brief statement of chromosome behavior in crosses between 14- and 21-chromosome wheats, and its responsibility for the correlation of the characters of the 14-chromosome parent, including rust-resistance, and therefore for the difficulty in securing resistant 21-chromosome segregates.—Author.

3610. USHER, C. H. A pedigree of congenital dislocation of lenses. *Biometrika* 16: 273-282. *Fig. A-BB*. 1924.—The author describes a pedigree including 3 generations, in which 7 cases of congenital dislocation of lenses occurred. The affected $P_1\sigma$ had 9 children, of whom 5 (3σ , 2φ) were affected. One of the affected sons had 1 son also affected. Previously described cases are compared and discussed.—C. W. Metz.

3611. VALLEAU, W. D. The improvement of Burley tobacco plant varieties by selection. *Tobacco* 79: 56-59. 1925.—Strains of Burley tobacco resistant to root-rot, which have exactly the same type and quality as the original variety, have been obtained and in 1924 were grown on about 75,000 acres. Where no disease was present, no difference in growth could be noticed. In 1 case a resistant strain markedly superior on infected soil was distinctly less vigorous than the original variety on un-infected soil; the reason for this behavior is unknown.—D. F. Jones.

3612. VRIES, HUGO DE. Androlethal factors in *Oenothera*. *Jour. Gen. Physiol.* 8: 109-113. 1925.—*O. Lamarckiana* does not possess gamete lethals, as do *biennis* and *syrticola*, but it does have a pair of zygote lethals which prevent any but the combination *laeta* \times *velutina* from surviving. Gamete lethals are displayed, however, in many of its mutants. The specific factor complexes of *Lamarckiana* differ from the majority of wild species, 1st, in the non-disjunction of the mutating chromosome after conjugation in synapsis; and 2nd, in the almost constant presence of an androlethal factor which kills in the pollen all of the gametes carrying the mutated characters. It is because of this fact that specific mutations are not inherited in crosses through the pollen, but only through φ gametes. In some cases, also, the factor complexes of the specific mutations of *Lamarckiana* must possess gynolethal units, as for instance in *lata* and *scintillans*, where only $\frac{1}{2}$ of the mutated ovules produce viable germs after fertilization, the other $\frac{1}{2}$ being totally absent among the offspring, or only rarely present. In *semigigas* the chromosomes are doubled only on the maternal side, and the almost complete sterility of the pollen is explained as due to the presence of androlethals for all of the chromosomes, so that only those would prove viable in which the specific mutations had previously disappeared. These androlethals are assumed to be absent in *gigas*, where doubling occurs on both sides. It is hoped that races of *lata* and *scintillans* with 16 chromosomes, produced through the loss of the androlethal factor carried by these races, may be obtained through crossing with *gigas*, and that thus one of the main differences between experimental mutants and wild species will be eliminated.—Ralph E. Cleland.

3613. VRIES, HUGO DE. On physiological chromomeres. *Cellule* 35 (Vol. jubilaire V. Grégoire, Ire partie): 1-15. 1925.—In *O. Lamarckiana* the factors for the main mutant types are distributed among the respective chromosomes, 1 to each chromosome—7 in all. These are the mutants *lata*, *scintillans*, *cana*, *palescens*, *liquida*, *spathula* and *pulla*. Evidence "shows these types to be the representatives of the main mutable linkage groups in the 7 different chromosomes. . . . Besides the 7 typical mutants there are 2 others which constitute old and permanent races of almost the same rank," that is, *albida* and *oblonga*. This makes a total of 9 "linkage groups" or "physiological chromomeres," indicating that in some

cases 2 or more must be in the same chromosome. In such cases the 2 or more should show some kind of linkage to one another and the author presents evidence to support this view.—*C. W. Metz.*

3614. WAARDENBURG, P. J. Over een recessieven vorm van aangeboren opthalmoplegia. [A recessive form of congenital ophthalmoplegia.] *Genetica* 6: 487-492. 1 fig. 1924.—Ophthalmoplegia is a rare congenital nervous anomaly of the eye. In most cases it is combined with drooping eyelids (ptosis). The ptosis alone, as well as the combination of ptosis with ophthalmoplegia (paralysis of all or many of the eye muscles) behave as dominant characters in the few cases that have been described. The author was able to prove that besides the dominant form there exists also a recessive form. He discovered the connecting link between 2 isolated families with affected members whose parents in both cases were relative and non-affected. The predisposition must have arisen at least 4 generations before. The type of anomaly (divergent upward squint with extremely narrow pupils) was the same in all the affected members of the pedigree.—*Author.*

3615. WARREN, E. On an interspecific hybrid of *Digitalis*. *Biometrika* 16: 205-238. Pl. 1-6. 1924.—The author reports a study of the F_1 and backcross of *Digitalis gloxiniaeflora* Clem. by *Digitalis lutea* L., the characters studied being leaf ratio ($\frac{\text{breadth}}{\text{length}} \times 1000$), pilosity,

thickness of leaf-lamina, venation of leaf, indentations of leaf, rate of desiccation of leaf, size of cells of lower epidermis of leaf, number of stomata, length of guard cells, length of corolla, color of flowers, spotting of corolla, length of sepals, and width of sepals. The means of these 14 characters in the backcrosses were compared with the means of the 2 parents and very varying dominance on the part of one or the other parent was found. After numerous chromosome counts, the author concluded that the haploid number of chromosomes for *D. gloxiniaeflora* was sometimes 12 and sometimes 13, for *D. lutea* 8, for the hybrid sometimes 10 and sometimes 11, for *gloxiniaeflora*-backcross 11 or 12, and for *lutea*-backcross 8 or 9. The selfed *D. gloxiniaeflora* parent showed a high degree of fertility, while *D. lutea* showed considerable sterility. Of the species crosses, *D. gloxiniaeflora* (\varnothing) \times *D. lutea* (σ) exhibited a much higher fertility than the reciprocal cross *D. lutea* (\varnothing) \times *D. glox.* (σ), no plants reaching maturity from the latter cross. *Lutea* pollen was found to be much more effective than the pollen of *D. gloxiniaeflora* when used for backcrossing. Very little correlation was shown among most of the characters selected for study, but a definite negative correlation was found between number and size of stomata.—*W. A. Carver.*

3616. WEATHERBY, C. A. Inconstancy in color forms of *Hepatica americana*. *Rhodora* 27: 131-132. 1925.—Four plants of *Hepatica americana* transplanted from the woods to yard conditions were observed by the author to change flower color during the succeeding seasons. The white flowered plant remained white. The pink flowered plant produced white flowers for 4 years, then the original deep pink, and the next season, paler pink. Of the blue flowered plants, 1 remained blue with the exception of 1 year when the flowers were paler, while the other, after 6 years of unvaried blue, produced lilac pink flowers. Similar cases of inconstancy of color in *Viola pedata f. rosea* and *Rudbeckia hirta* are cited. The author discusses probable causes of the variability of the Hepaticas—a constitution subject to variation, the changed conditions after transplanting, and a pathological condition which seemed improbable in view of the vigor of the plants.—*Mary Ellen Peck.*

3617. WELLENSIEK, S. J. De verschillen tussen doperwtten en peulen. [The differences in pod thickness in peas.] *Landbouwkundig Tijdschr.* 37: 378-385. 1925.—Parchmented peas possess a strongly developed sclerenchymatous layer on the inner side of the pod-wall. Sugar peas, lacking this strong membrane, produce edible unripe pods. Among the sugar peas some varieties still have a very thin membrane, from which other varieties are absolutely free. Parchmented peas may be represented by the formula $PPVV$, sugar peas with a thin membrane by $PPvv$, sugar peas without any membrane by either $ppVV$ or $ppvv$. A bud-mutation is described showing 2 branches with sugar peas ($PPvv$), 1 branch with parchmented peas ($PPVV$), the 4th branch bearing 1 sugar pea and, for the rest, parchmented peas. As this mutation was found in a sugar pea line, the factor v must have changed into V . Cooking experiments have shown that no differences in taste were found between the 3 types described

above if the fruits were consumed very young, when about 1 inch long. At a further stage of development, parchmented peas could be made edible by taking away the membrane before cooking. In this case they did not show any sign of fibrousness. Sugar peas with a thin membrane became more fibrous with increasing age, but the varieties without any membrane did not. Therefore no thin-membranous varieties are wanted, and in breeding sugar pea varieties one should pay due regard to this characteristic. This is a rather easy task in so far as the absence of membrane is recessive.—*Author*.

3618. WELLENSIEK, S. J. *Genetic monograph on Pisum*. *Bibliographia Genetica* 2: 343-476. 4 fig. 1925.—In this paper the literature on heredity phenomena in *Pisum* has been reviewed. It is divided into the following chapters: Systematics, source and origin, flower-biology and cognate questions, observations and investigations before 1900, genetic factors in *Pisum*, interrelation of genetic factors, mutations, inquiries of a special nature, list of literature, index.—*Author*.

3619. WELLENSIEK, S. J. *Pisum crosses I*. *Genetica* 7: 2-64. Fig. 1-2. 1925.—In a number of *Pisum* crosses the author found 18 factors. In the following cases a monofactorial difference was found (the symbol is in parenthesis and the dominant characteristic is mentioned 1st): yellow and green cotyledon color (*I*), smooth and wrinkled cotyledon (*R*), normal and fasciated stem (*Fa*), green and yellow pod color (*Gp*), straight and curved pod form (*Cp*), blunt and acute apex (*Bt*), thin and thick pod wall (*N*). In 5 cases a bifactorial basis was found for the characters investigated. These cases are: Flower color—pink A_1A_2 , white A_1 and purple A_1A_2B ; foliage character—bloom B_l , no bloom bl , dense bloom BlW ; flowering time—early if^1 , intermediate If^1 , late If^1Lf^1 ; position of 1st flower—low sn_1 , intermediate Sn_1 , high Sn_1Sn_2 ; pod thickness—no membrane p , thin membrane P , thick membrane PV . The pod color is influenced by A_1 and P_1 as well as by Gp ; A_1 and P_1 together give violet when Gp is present and red when Gp is absent; in the absence of P_1 , Gp always gives green, gp always yellow. These multifactorial segregations add to the results obtained by other investigators. Preliminary results as to the interrelation of factors have been dealt with. Linkage was evident between $B-Bt-Cp$, If^1-Sn_1 , $Gp-Cp-N$ and $B-V$. The factors Gp and N were found to show a crossing over percentage of about 50% and therefore linkage would have escaped observation if both factors were not linked to Cp . Most of the linkages, however, need further confirmation.—*Author*.

3620. WETTSTEIN, FRITZ VON. *Genetische Untersuchungen an Moosen (Musci und Hepaticae)*. [Genetic investigations on bryophytes.] *Bibliographica Genetica* 1: 1-30. 1924.—A general review of the literature to December, 1923, including, however, some of the author's own work published in 1924. The discussion includes a brief survey of such morphological and cytological characteristics as are considered significant from the genetic point of view; and a summary of cytological and experimental genetic work on bryophytes, with special emphasis upon sexuality and sex inheritance. A list is included of specific chromosome numbers, one of reported hybrids, and one of the species from which bivalent races have been obtained by apospory.—*C. E. Allen*.

3621. WHITE, ORLAND E. Leaf color seedling variation in *Duquetia*. *Jour. Heredity* 16: 381-382. 1 fig. 1925.—Between 25 and 50 seeds of a normally green-leaved species of *Duquetia* (Anonaceae), collected in Bolivia, were planted in a greenhouse in Brooklyn. Of the 2 which grew, one was yellow-leaved, the other normal green-leaved. The yellow-leaved seedling grew much more rapidly under greenhouse conditions at Brooklyn than the green-leaved seedling. Since the yellow-leaved seedling appears so healthy, the change in leaf color is assumed to have been mutative rather than from disease. Even when the chances appear remote, mutations may occur, and the mutant may be better adapted to the changed conditions than the normal parent.—*Author*.

3622. WIGGANS, R. C. Variations within and between morphological varieties of oats and barley. New York [Cornell] Agric. Exp. Sta. Mem. 94. 1-85. 1925.—A careful study was made of the yielding ability of various strains of the morphological varieties of oats and barley as follows: Oats—12 representatives of Swedish Select, 21 of Irish Victor, 15 of Danish Island, 8 of C. I. No. 602, 13 of White Tartar, 8 of Golden Drop, 12 of Lincoln, 9 of Green Russian, 15 of Silvermine, and 7 of Victor; barley—2 representatives of Vermont Cham-

pion, 19 of Manchuria-Oderbrucker, 2 of Rumanian Spring, 7 of Hanna, 3 of Manchuria Selection, 3 of Bay Brewing, 3 of Chilian Brewing, 3 of Chevalier, 2 of Goldthorpe, 5 of O. A. C. No. 21, and 4 of Norwegian Two. The test was conducted for 5 years. The strains within a variety differed markedly in yield. In all but 3 cases, the difference between the highest yielding strain of a variety and the lowest was great enough to give odds of 31:1 that the difference was a real difference and not due to random sampling.—*Fred Griffee.*

3623. WILSON, JAMES. A theory of the mode of inheritance of milk yield in cattle. Jour. Dept. Lands and Agric. [Ireland] 25: 44-53. 1925.—From 8 to 10 grades of maximum daily milk yield, ranging from 10 to 50 pounds, were observed in a group of 1st calf Shorthorn heifers. It is suggested that the inheritance of milk yield may be explained on the assumption that there are 16 grades of maximum yield and 4 pairs of factors to produce them. In tables are shown the 16 probable kinds produced by crossing and continuing to breed from the descendants of 2 pure breeding lines which differ in 4 pairs of characters. It is pointed out that milk yielding capacity does not necessarily indicate milk breeding capacity.—*H. C. McPhee.*

3624. WINTERS, LAWRENCE M. Animal breeding. 309 p. 65 fig. John Wiley & Sons: New York, 1925.—The book is a general text suited to the needs of students and livestock breeders. The subject is divided into 4 parts: (1) "The foundation," which discusses the economic and biological background; (2) "The physiology of reproduction," which gives the essential facts regarding reproduction; (3) "Heredity," in which some of the simple principles of genetics are explained and their applications to livestock breeding discussed; and (4) "The practice," in which general comments on the development of breeding, methods of improvement, sterility, and the care of breeding stock are given.—*H. C. McPhee.*

3625. YOUNG, W. J. Some phases of breeding work and seed production of Irish potatoes. South Carolina Agric. Exp. Sta. Bull. 210. 1-20. 3 fig. 1922.—The McCormick or Lookout Mountain was selected as a basis for the work which had for its object the production of better quality fall varieties, and of varieties which can be propagated by seed just as effectively as from tubers. The study of correlations and the transmission of characters; seed production, and the conditions favoring it; a study of germ cell formation and the cytological features involved; and the responsibility for the failure of blossoms to set seed are discussed. Thus far the selected seedlings have not been sufficiently tested to judge their merits. As yet no seedling raised approaches the mother parent in seed production. A high degree of correlation was observed in the fall crop of Lookout Mountain between vegetative growth and seed production and vegetative growth and yield of tubers. This variety was found to be heterozygous with respect to color of flower and tuber and to shape of tubers but is apparently homozygous with respect to depth of eyes. With respect to seed production it should, theoretically, be a homozygous recessive and the F_1 generation should produce seed freely. As a matter of fact the opposite tendency has been found to be the case. Hereditary sterility of the pollen is suggested as a possible cause as is also unfavorable environmental conditions causing premature dropping of the flower buds. A gradually declining temperature, especially cool nights, favors seed production. Abscission of the blossoms may take place at any stage in the development of the buds and blossoms.—*W. Stuart.*

3626. ZWANN, A. R. New principle in selecting spinach. Seed World 18: 7-9. 1925.—When spinach is running to seed many different types of plants are revealed, for example, some have ♂ and some ♀ flowers. The general notion that ♂ and ♀ plants occur in the same ratio is stated to be positively incorrect. Climatic conditions influence the occurrence or non-occurrence of ♂ plants. In a hot and dry climate there is a much higher percentage of ♂ plants. Pure lines may vary in this respect. A line producing 98% of ♂ plants has been observed. Good moisture and a cool climate stimulate leaf development and counteract tendency to run to seed. Careful observation by the author enabled him to detect different types of ♂ and ♀ plants. Type 1 is the pure ♀ plant with leafy stems bearing only ♀ flowers; type 2 bears hermaphrodite flowers with the leafy habit of type 1 but a less abundant production of seed; type 3 consists of ♂ plants with the habit of ♀ plants, producing ♂ flowers in the axils and not developing seed; type 4 consists of typical ♂ plants with a plume-like flower truss. Intermediate types have been noted. The breeder selects his superior strains from types 1 and 2. Several superior varieties have been obtained and named. "Zwann's Princess Juliana" represents the first pure hermaphrodite variety. The possibility of making spinach a biannual is regarded as not improbable.—*W. Stuart.*

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F. C. BRADFORD, *Editor*

(See also in this issue Entries 3081, 3086, 3123, 3127, 3135, 3140, 3214, 3228, 3272, 3296, 3303, 3309, 3312, 3386, 3399, 3418, 3474, 3475, 3542, 3570, 3604, 3617, 3618, 3626, 3653, 3973, 4008, 4034, 4041, 4153, 4154, 4174, 4180, 4219, 4222, 4231, 4385)

3627. ANONYMOUS. American trees and shrubs in the park of Hatarmajor, Rumania. Jour. Arnold Arboretum 6: 209-211. 1925.

3628. ANONYMOUS. The poinsettia. Missouri Bot. Gard. Bull. 13: 143-148. Pl. 36-37. 1925.—This paper presents a popular account of *Euphorbia pulcherrima*, including a summary of hybridization experiments carried on by H. E. WHITE in 1923.—O. T. Wilson.

3629. ANONYMOUS. [REV. OF: STUCKEY, H. P., AND E. J. KYLE. Pecan growing. xiii + 233 p. 12 pl. (Rural Science Series.) The Macmillan Co.: New York, 1925.] Nature 116: 391. 1925.

3630. ADAM, D. B. Cool storage of fruit. Report on experiments conducted during 1923 season. Jour. Dept. Agric. Victoria 22: 577-590. 1924.—This is a report on the storage of pears, apples, oranges, apricots, plums, and peaches. Blackening and mold decay of pears are more serious at 34°F. than at 32°F. "No direct evidence has been obtained yet that arbutin exists in the surface cells of Kieffer pears, though the indirect evidence mentioned in the last report have been confirmed." The effects of maturity, temperature and packing on the storage of apples and other fruit are shown.—Wm. E. Lawrence.

3631. ALLEN, W. J., AND W. LEGRAY. Pruning tests at Bathurst Experiment Farm. Agric. Gaz. New South Wales 36: 823-826. 1925.—It was found, contrary to popular opinion, that fruit spurs developed satisfactorily on Jonathan trees, when the yearly laterals were somewhat shortened. Such shortening is not necessary in strong growing young trees. Generally speaking, with apples and pears, the leaders should be topped heavily, until the lower part of the frame work is established.—L. R. Waldron.

3632. ALSMEYER, LOUIS H. Citrus culture in the Rio Grande Valley. Amer. Fruit Grower 45¹²: 3, 16. Illus. 1925.

3633. AUBIN, L. L'incision annulaire du pêcher. [Ringing peaches.] Prog. Agric. et Vitic. 75: 356-357. 1920.—The author reports increase in size of fruit and earlier maturity of fruit on ringed branches.—E. L. Proebsting.

3634. AUCHTER, E. C. New developments in pruning peach trees. Amer. Fruit Grower 45¹²: 5, 10, 14. Illus. 1925.—The present method of pruning peach trees advocated is characterized by light pruning and is a radical departure from the severe pruning formerly practiced. After discussing the physiological effect of pruning and showing that it is a dwarfing process, the author discusses the pruning of the young tree, pruning after the 1st, 2nd and 3rd year's growth, respectively, summer pruning the 1st year, and pruning bearing trees. Under the new system the trees are said to become wider and to require more space. It has also been found necessary to fertilize each tree heavier and to give earlier and thorough cultivation. In Maryland, over a period of 4 years, the total yield of moderately pruned peach trees was nearly 3 times that of dehorned trees.—Arthur S. Rhoads.

3635. BAKKER, G. J. Groenbesteding in theetuin. [Green manuring in tea gardens.] Thee 4: 81-82. Illus. 1923.—The author gives an account of the procedure in using *Albizia*, *Dadap* (*Erythrina*), and *Crotalaria Usaramoensis* as shade and green manure combined, in a West Java plantation. The tops of the shade trees are cut back heavily.—Carl Hartley.

3636. BARTHÉLEMY, L. Les travaux au vignoble. Le sulfatage. [The work of the vineyard. Sulphuring.] Prog. Agric. et Vitic. 74: 493-495. 1920.

3637. BARTHÉLEMY, L. Les travaux au vignoble. La taille. [Pruning the vineyard.] Prog. Agric. et Vitic. 75: 372-375. 5 fig. 1920.

3638. BERNARD, CH. Vermenigvuldiging van lamtoro. [Propagation of *Leucaena glauca*.] Thee 4: 45-46. 1923.—Propagation by cuttings is difficult, succeeding only in very favorable weather.—Carl Hartley.

3639. BERNARD, CH. *Vervalschte? theezenen.* [Adulterated (?) tea seed.] *Thee* 6: 38. *Illus.* 1925.—This paper reports the first case on record of seed adulteration in tea.—*Carl Hartley.*

3640. BRADFORD, F. C. *Orchard cover crops.* *Michigan Agric. Exp. Sta. Circ.* 69. 1-3. 1925.

3641. CASTELLA, F. DE. *Some ampelographical notes.* *Jour. Dept. Agric. Victoria* 22: 615-623. 1924.—The synonymy of varietal names of the grape is discussed together with notes on their history.—*Wm. E. Lawrence.*

3642. COHEN STUART, C. P. *Proeven over het dekapiteeren van theeloten (snoei, pluk en regeneratie).* II. [Experiments on the decapitation of tea shoots, on pruning, picking and regeneration. II.] *Dept. Landb. Nijverheid en Handel, Mededeel. Proefsta. Thee Nederland.-Indië* 79: 1-30. *Illus.* (English Summary.) 1922.—Tea requires continuous production of young shoots and continuous pruning is therefore necessary. Pruning, and picking which is a mild form of pruning, result in no increase of strength but rather stimulate the plant to use up reserve food. A severely pruned bush twice stripped of its young flush dies from exhaustion. Pruning and picking must therefore be cautiously done and compensated by manuring. All of the buds of an unpruned branch are stimulated as a result of the cutting back of nearby branches, and the stimulus is proportional to the degree of cutting of the other branches. This evidence fits better into a hydrostatic hypothesis than with the hypothesis that growth of the lower buds is controlled by substances secreted by the terminal bud.—*Carl Hartley.*

3643. COLBY, C. C. *An analysis of the apple industry of the Annapolis-Cornwallis valley.* *Economic Geography* 1: 173-197. 13 fig. 1925.—This paper reports a study of soil conditions, climate and topography of this region in their relation to apple production. Consideration is made of the method of cultivation, kinds of fertilizers used and the methods of insect and other pest control.—*William H. Cole.*

3644. COOKE, W. W. *Experiments with plum and prune stock.* *Agric. Gaz. New South Wales* 36: 821-822. 1925.—Results seem to indicate that plums and prunes grafted on apricot and peach stocks, do better than those grafted on plum and prune stocks. In certain cases, plum and prune stocks resulted in earlier bearing than apricot and peach stocks.—*L. R. Waldron.*

3645. CRAMER, P. J. S. *Our inoculated Hevea-trees in their first test year; their growth and production.* *Communicat. Gen. Agric. Exp. Sta.* 17. 1-36. (Arch. Rubbercult. Nederland.-Indië 87:) Buitenzorg, 1924.—The growth of the budded trees experimented with will probably lag behind that of the seedlings; the stems are less conical, which postpones the tapping age. With scions from faster growing stock, this inferiority may be removed. In general the yield of the budded trees has been superior to that of seedlings. It appears that the scion increases the latex yield of the stock.—*Carl Hartley.*

3646. DEGRULLY, L. *Influence de la forme de combinaison de la potasse sur l'action des engrais.* [Influence of the form of combination of potassium on the action of fertilizers.] *Prog. Agric. et Vitic.* 74: 389-392. 1920.—The author reports that carbonate of potassium gives the highest yield of grapes, followed in order by the sulphate and the chloride.—*E. L. Proebsting.*

3647. DEGRULLY, L. *La préservation des vignes contre les gelées printanières.* [Protection of vines from spring frosts.] *Prog. Agric. et Vitic.* 74: 246-253. 8 fig. 1920.—Opening of buds in grapes may be delayed 8-12 days by applying a wash of iron sulphate or of dilute sulphuric acid. Other helpful measures discussed are: Sprinkling with water, smudging, heating, and covering the vines in various ways with different materials.—*E. L. Proebsting.*

3648. DENNETT, J. H. *A report on the nipah [Nipa] palm and the production of alcohol in British North Borneo.* *Malayan Agric. Jour.* 13: 64-71. 1925.

3649. DEUSS, J. J. B. *Bemesting in theetuin.* [Manuring tea.] *Thee* 4: 113-115. 1923.—Experiments with the application of manure have been conducted by the Tea Experiment Station in Java since 1896. The resulting recommendations follow: I. In existing plantations (1) on grounds in good tilth and rich in humus, complete fertilizers should be combined with green manuring; the use of potassium is mainly for the benefit of the green-

manure plants; (2) on poorer soil the same procedure, with the green manure and nitrogenous manures continued indefinitely, and the addition of organic mulches; (3) on heavy soils with fair humus content, heavy green manuring and mulch, and the addition of nitrogen and phosphorus. Either potassium or lime, or both, are also desirable to help the legumes. (4) On heavy, poor soils, lime; green manures so far as they can be induced to grow with the help of commercial fertilizers; mulch. II. If 50 ha. are to be planted to tea, 5 are used exclusively for green manure plants. The remainder should be planted with tea and green manure plants in alternate rows; but if the ground is not good the green manure should be grown alone and manured for the first year. After the tea is planted it is treated with commercial fertilizer and mulched with the tops of plants cut from the 5-ha. green-manure planting. The intergrowing of green manure and addition of mulch is continued indefinitely and supplemented with commercial fertilizers as needed.—*Carl Hartley.*

3650. FAES, H., ET F. PORCHET. Étude de l'influence de divers porte-greffes sur la qualité et quantité de récolté. [The influence of different stocks on the quality and quantity of the product.] *Prog. Agric. et Vitic.* 75: 452-454. 1920.

3651. FERRIS, E. B. Report South Mississippi Branch Experiment Station 1922-24. Mississippi Agric. Exp. Sta. Bull. 225. 1-19. 1925.—Banking Satsuma trees 12 inches high saved the bases from freezing. These live stumps produced 2-4 times as much growth the following year as trees freshly set in the same season.—Peach trees under sod culture budded and bloomed much earlier than those under clean culture, thus increasing hazards from late spring frosts.—*J. F. O'Kelly.*

3652. GARRETSEN, A. J. Enkele aantekeningen over grondbedekkers. [Notes on ground covering plants.] *Thee* 4: 83-85. *Illus.* 1923.—Records of experience in Java plantations are given for *Salvia occidentalis*, *Mimosa invisa*, *Vigna oligosperma*, *Phaseolus scaberrulus*.—*Carl Hartley.*

3653. GOODERHAM, C. B. Bees as agents in cross pollination. Canada, Dept. Agric. Exp. Farms, Rept. Dominion Apiarist 1923: 6-8. 2 fig. 1924.—Four apple trees of the McIntosh variety were used, one being left uncovered as a check, one covered with a cheesecloth tent containing a bee colony, one covered with wire screening permitting the entry of small wild bees and flies, and one covered with a tent impervious to insects. Flowering branches of other varieties were kept in each tent. The check had a set of 21.8%, cheesecloth tent 10.2%, wire tent 19.1% and impervious tent 1.7%.—*T. G. Major.*

3654. GRIFFITH, J. P. The Queensland Raspberry (*Rubus probus*). A species adapted to tropical conditions. *Jour. Dept. Agric. Porto Rico* 9: 29-45 [1925].—This is a cross between *Rubus ellipticus* and *R. rosaefolius* and is said to have originated in Australia. It is exceptionally vigorous and productive. The author repeats Bailey's technical description and gives a discussion of propagation and training, with general observations on this and other species of *Rubus* in Porto Rico, including a discussion of *R. rosaefolius* which grows very abundantly in the hills, and also of an introduced Ceylon raspberry.—*Mel. T. Cook.*

3655. HAWKINS, LON A., AND WILLIAM R. BARGER. Cold storage of Florida grapefruit. U. S. Dept. Agric. Dept. Bull. 1368. 1-6. 1925.—These experiments show cold storage of Florida grapefruit to be commercially practicable, the best temperature being around 32°F., at which fruit could be stored 6-8 weeks. For a longer storage period, it was found advisable to cure the fruit by exposing it to an air temperature of 70-75°F. with a humidity of about 65% for 1-2 weeks or to treat it with kerosene stove gas in a coloring room 3-4 days. The latter method is preferable because during the curing process the buttons will be loosened so that most of them can be removed readily. The removal of the buttons tends to decrease the amount of decay in storage.—*Lon A. Hawkins.*

3656. HEPBURN, J. Refrigeration of today as applied to fruit. *Jour. Dept. Agric. Victoria* 22: 633-635. 1924.—The installation of long-distance thermometers, and instruments for measuring humidity and carbon-dioxide is recommended. This is especially important for shipment by water because of poorer air circulation in the holds of ships. Five rules for successful refrigeration are given.—*Wm. E. Lawrence.*

3657. HEPNER, M. J. National rootstock survey. *Amer. Fruit Grower* 45¹¹: 5, 24. 1925.—The report presented is based on approximately 13,000,000 budded or grafted trees

sold during the season of 1924-1925. After discussing the local uses of stocks, the author presents a tabular summary of the rootstock situation, which shows the most favored stocks for the various deciduous fruits to be as follows: For both sweet and sour varieties of cherries, the Mahaleb root; for plums, the Americana or native plum; for prunes, the Myrobalan root; for pears, the Japanese stock; for apricots, the peach root; for peaches, the peach root which is practically the only root of importance, and for almonds the peach and almond. The variations that exist in different regions for the various rootstocks are also discussed in detail, the country being divided arbitrarily into 7 sections. A tabular summary is presented for the North Atlantic States, the Southern States, and California. The variations shown to exist in all sections of the country as far as the rootstock demand is concerned are held to be due to definite conditions, such as differences in soil, moisture, climate, etc.—*Arthur S. Rhoads*.

3658. HOPKINS, ELIZABETH F. *Studies on lettuce seed germination*. Proc. Assoc. Official Seed Analysts of North America 1923: 68-69. 1924.—In a study of the value of pre-soaking lettuce seed in water below room temperature for 2 hours previous to placing the seed to germinate it was found that generally the seed of the black-seeded types of lettuce are heavier than the white-seeded type and that when placed in water the black seed sink immediately while the white seed show a marked tendency to float. There is scarcely sufficient difference between the specific gravities of the 2 kinds to account for this behavior and it is believed to be largely due to a dissimilarity of the external character and composition of the seed coat, although in general the structure of the seed coat of the 2 types is identical, consisting of 3 more or less distinct, separate coverings. The cutinous testa of the black seed is more deeply ribbed, and shows tiny fibrous tubercles. These are absent in white seed which have a translucent, wax-like surface. In experiments in which sets of 100 seed each from 54 samples of both white and black seeded lettuce were soaked in water at 20°C. for 2-hour periods from 2 hours to 14 hours and also compared with dry seed put to germinate at the same time, it was found that the black-seeded lettuce is slightly less responsive to soaking. Soaking for 2 hours is sufficient. A rather sharp decline in germination begins after 14 hours soaking. Secondary dormancy may be caused by soaking at a temperature higher than 20°C. All the evidence obtained shows that at present there is no better known method for testing the viability of lettuce seed than to soak the seed in water at 20°C. or below, for 2 hours previous to germination. Lettuce seed was found to retain its viability for several years if properly stored. Newly harvested lettuce seed often fails to germinate promptly. However, it may be made to do so by clipping off the end opposite the embryo, or by slipping off the seed coat, which is easily done after the seed is moistened.—*M. T. Munn*.

3659. KLEIN, LUDWIG. *Ziersträucher und Parkbäume*. [Ornamental shrubs and park trees.] (Sammlung naturwissenschaftlicher Taschepbücher. X. [Pocket manuals of natural science series.]) 135 p. 108 pl. O. Heidelberg, 1923.—The book is intended chiefly for the garden lover and amateur as a guide to the most ornamental and generally cultivated trees and shrubs. The species, with their most important varieties, are arranged in systematic order beginning with Ginkgoaceae, and are fully described. Many of the more ornamental forms are illustrated in color and some of the less showy species in black and white.—*Alfred Rehder*.

3660. LAURIE, ALEX. *Rose culture*. Michigan Agric. Exp. Sta. Circ. 84. 1-7. 2 fig. 1925.—This paper presents a brief, popular discussion of rose culture in Michigan from the standpoint of soil, culture, winter protection, pruning, pests, and choice of varieties.—*Ernst A. Bessey*.

3661. LORD, E. L. *Differentiation of native species of grapes*. Florida Fruits & Flowers 35-6: 4-6. 1925.—After discussing the ways in which native grapes may be of value to the vineyardist, the author describes and presents the characteristics and horticultural value of the species of grapes native to Florida, of which there are said to be at least 11; a key for distinguishing these species is included.—*Arthur S. Rhoads*.

3662. LOREE, R. E. *The nutrient requirements of the strawberry*. Michigan Agric. Exp. Sta. Tech. Bull. 70. 1-29. 1925.—The plants studied were grown in dune sand in 6-inch pots in the ground—35 pots for each fertilizer treatment and 18 different lots, including

the unfertilized control. The fertilizers applied, amounts used, dates of application and results are discussed in detail. Throughout the experiment the soil remained at about pH 7.5. The variety used was Senator Dunlap. The largest plants came from applications of fertilizer both spring and summer; N was the chief limiting element for vegetative growth; P combined with N gave larger vegetative growth and fruit production than N alone. More runners were produced by spring applications of N alone or combined with other elements than by summer applications of the same fertilizer. Fertilizer treatments increased the sugar and decreased the polysaccharides. Spring treated plants contain more free reducing sugars than summer treated plants. There is a close relation between the amount of sugar in the plants and the potash content. The total number of flowers per plant depends mostly on the number of clusters, not on the number of flowers per cluster. Nitrogenous fertilizers increased the number of flower clusters, summer applications being twice as effective as spring applications. Spring applications in the fruiting year have no influence on the number of clusters, but this latter application caused a better setting of the blossoms and increased size of berries. Nitrogen alone or in combination with other fertilizers caused increase of total yield. The largest yield came from spring-summer-spring fertilized plants. Variations in the N content of the plants have greater effect on yield than variations in carbohydrate content. Fertilizer treatment had little effect on the moisture content, texture or quality of the fruit.—*Ernst A. Bessey.*

3663. LYON, T. L., A. J. HEINICKE, AND B. D. WILSON. **The relation of soil moisture and nitrates to the effects of sod on apple trees.** New York [Cornell] Agric. Exp. Sta. Mem. 63. 1-28. 1923.—It has been noted frequently that the continuous growth of grass under apple trees decreases the growth of the trees. This experiment was undertaken mainly for the purpose of testing the hypothesis advanced by Lyon and Bizzell in 1913, that the grass, causing an almost complete disappearance of nitrates in the soil, might account for this injury. Apple trees grown on field plats continuously in sod, and on plats in which rye was used as a cover crop, were all fertilized with acid phosphate and muriate of potash. Nitrate of soda was applied to certain of the sod and cover-crop plats at the respective rates of 900, 300, and 100 pounds per acre, and was withheld entirely from others. Moderate differences in moisture content of the soil were observable between the variously treated plats, but they were slight as compared with the differences in the nitrate N present. Nitrates were always low under the sod except when large quantities of nitrate of soda had been recently applied. Tree growth was greatest on those sod plats which received the greatest quantity of NaNO_3 , indicating a deficiency of available N under the unfertilized sod. That the removal of moisture from the soil by the grass was not an important factor in tree growth was indicated by the fact that the growth of the trees was greatest on those sod plats in which the moisture was least, owing to a greater growth of grass resulting from the large applications of NaNO_3 . Apparently the maintenance of an adequate supply of nitrate N in the soil used in this experiment was the determining factor in tree growth, and soil moisture was very much less important. The injurious effect of the sod on the growth of young apple trees was reduced by the annual application of $\frac{1}{2}$ pound of NaNO_3 per tree. Trees on cultivated plats did not respond to the addition of nitrate fertilizer, while those on sod plats receiving $\frac{1}{2}$ pound per tree averaged more than twice the weight of those on sod plats without nitrate. Trees on sod plats receiving NaNO_3 showed vigorous terminal growth, but relatively few strong branches as compared with trees on cultivated plats. Trees on sod plats receiving no nitrate N had relatively heavy roots as compared with those on cultivated plats, but the roots from trees on sod plats receiving heavy applications of nitrate constituted a much smaller part of the total weight of the tree. The roots from trees on cultivated plats were more fibrous as compared with those from trees on sod plats.—*A. J. Heinicke.*

3664. LYON, T. L., A. J. HEINICKE, AND B. D. WILSON. **The relation of soil moisture and nitrates to the effects of sod on plum and cherry trees.** New York [Cornell] Agric. Exp. Sta. Mem. 91. 1-21. 1925.—Plum trees and cherry trees were grown on field plats continuously in sod, and on plats on which rye was used as an annual cover crop. All were fertilized with acid phosphate and muriate of potash, NaNO_3 being applied to certain of the sod and of the covercrop plats, and withheld entirely from others. Nitrate N was always low under sod,

except when large quantities of NaNO_3 had been recently applied. During the dry year of 1921 the soil moisture was lower in sod than in cultivated plats, but there was no difference in this respect during 1922. Tree growth was greatest on those sod plats which received the greatest quantity of NaNO_3 , indicating a deficiency of available N under the unfertilized sod. The low moisture content in 1921 was evidently not a limiting factor in growth, since the trees on many sod plats showed a greater increase in circumference in 1921 than in 1922, a year of abundant rainfall. That the removal of moisture from the soil by the grass was not an important factor in inhibiting tree growth was further indicated by the fact that the growth of the trees was greatest on those sod plats in which the moisture was least, owing to a greater growth of grass resulting from the large applications of nitrate of soda. Apparently the maintenance of an adequate supply of nitrate N in the soil used in this experiment was the determining factor in tree growth, and soil moisture was very much less important. The average growth of plum trees in sod which received 900 pounds or more of NaNO_3 was about twice as great as that of those which received no nitrate fertilizer. Plum trees on the cultivated plats showed no response to applications of NaNO_3 . The trees on the heavily nitrated sod plats, however, averaged only about $\frac{2}{3}$ as large as those on the cultivated plats. The average growth of cherry trees in sod which received 900 pounds or more of NaNO_3 was more than twice as great as in those which received no nitrate fertilizer. Cherry trees on the cultivated plats which received no NaNO_3 were about $\frac{2}{3}$ as large as those receiving the heaviest application. The cherry trees on the heavily nitrated sod plats averaged nearly as large as those on the cultivated plats without added N.—A. J. Heinicke.

3665. MACSELF, A. J. *Flowering trees and shrubs*. *Illus.* 224 p. (The Home Garden Books.) Chas. Scribner's Sons: New York, 1925.—This book treats of native and cultivated trees and shrubs from a horticultural standpoint. Among the subjects discussed are: Formation and planting of shrubberies; flowering shrubs for hedges and the rock garden; climbing shrubs; wall climbers, and shrubs benefited by wall protection; flowering trees and shrubs of tall, strong growth, as well as those of small dimensions; peat-loving shrubs (mainly Ericaceae); and advice on pruning and propagation.—A. H. Graves.

3666. MAAS, J. G. J. A. *Oculeeren in theezaadtuinen*. [Budding in tea seed gardens.] Mededeel. Proefsta. Thee Nederland.-Indië 76. 1-10. *Illus.* 1921.—Under the conditions prevailing on the northwest coast of Sumatra, cuttings failed; 80% success has been obtained with patch budding in which paraffined cotton wrapping is used for protection.—Carl Hartley.

3667. MANNING, L. E. *Native flowering evergreens*. *Amer. Forests and Forest Life* 31: 405-406. 1 fig. 1925.

3668. MINANGOIN, M. *Le vignoble Tunisien*. [The vineyards of Tunis.] *Prog. Agric. et Vitic.* 74: 469-471. 1920.

3669. MIŠAK, JOSEF. *Immergrüne Laubgehölze; Erfahrungen in Malonya*. [Broad-leaved evergreens; experiences in Malonya.] 78 p. 50 fig. Berlin-Westend, 1925.—The author pleads for a more extensive use of broad-leaved evergreens in parks and gardens and tries to show that the prejudice against them as being too tender for the colder regions of the temperate zone is unfounded. He cites as an example of their successful cultivation the park of Malonya in northern Czechoslovakia, about 95 miles east of Vienna, where the temperature in normal winters goes to -6°F . and in severe winters to -15°F .; and describes a large number of evergreen species successfully cultivated there, many of them illustrated by photographs of plants growing in Malonya. Various lists of the species according to their soil requirements, flowering and fruiting time, height, ornamental uses, etc., conclude the volume.—Alfred Rehder.

3670. NATHORST-WINDAHL, T. *Nyare asiatiska örter och deras värde för hortikulturen*. [Newer Asiatic herbs and their value in cultivation.] *Acta Hort. Gothoburg.* 1: 225-239. 5 fig. 1924.—The author, head gardener in the Bot. Garden, Gothenburg, gives an annotated list of commendable hardy perennials from Eastern Asia, mainly from China, with hints as to their decorative value and mode of culture. *Kirengeshoma palmata*, *Meconopsis integrifolia*, *Polygonum capitatum*, *Primula pseudocapitata* and *Saxifraga mandschuriensis* are figured from photographs taken in the Gothenburg Garden.—C. Skottsberg.

3671. NEHRLING, H. Fine winter flowering shrubs. Florida Fruits & Flowers 3⁵⁻⁶: 11-12. 1925.—After a brief enumeration of various shrubs that bloom during the winter in Florida, the author discusses several species of *Dombeya*, giving interesting notes and observations concerning the success of their planting in Florida. *Dombeya (Astrapea) Walllichii*, which is fully discussed, is said to be the most exquisite of all Florida's midwinter-blooming shrubs.—Arthur S. Rhoads.

3672. NEHRLING, H. Flor de mico or monkey flower, *Phyllocarpus septentrionalis*, magnificent flowering tree introduced from Guatemala by Wilson Popenoe in 1917. Florida Fruits & Flowers 3⁵⁻⁶: 12, 23. 1925.—The author describes this tree and gives his observations on its growth and behavior in southern Florida. He believes that this tree of winter-blooming and evergreen tendencies will become very valuable in South Florida gardens.—Arthur S. Rhoads.

3673. NICHOLLS, W. H. Apricot growing in Victoria. Jour. Dept. Agric. Victoria 21: 705-708. 2 fig. 1923; 22: 474-478, 641-644, 716-724. Fig. 3-16. 1924; 23: 105-108, 235-238. 2 fig. 1925.—A discussion of soils and stocks, propagation, varieties, planting, pruning, manuring, diseases, insect pests and drying. Although there is a succession of varieties ripening in Victoria from December to April, the Shipley, Tilton, Trevatt, and Rose d'Vaculuse are the only varieties favored for canning purposes. About 4,000 acres are devoted to apricot growing in Victoria. Plum stocks are preferred to peach stocks in irrigated sections.—Wm. E. Lawrence.

3674. PARTRIDGE, N. L. The fruiting habit and pruning of the Concord grape. Michigan Agric. Exp. Sta. Tech. Bull. 69. 1-39. 1925.—A scientific basis for pruning practise for this variety was sought in the experiments reported. Under Michigan conditions the vines are rarely over-vegetative, hence increase of vine growth usually means an increased crop. The amount of growth made by a vine while maturing its crop varies inversely with the size of the crop. Proper pruning of the vine is a means of regulating the size of the crop and hence the total amount of growth and number of canes produced. The more fertile the soil the larger the number of buds that must be left for vegetative growth. Usually the 4th to 9th nodes include the more productive portion of the cane. In the vineyard in which the experiments were conducted, a fruiting cane length of 8-11 nodes was the most productive. Cane 0.25-0.3 inch in diameter between the 5th and 6th nodes, and those with internodal length of 5-8 inches between the 5th and 6th nodes were more productive than those of larger or smaller dimensions. Canes growing directly from the trunk or from short arms are more productive than those growing from long arms, but the difference is not sufficient to warrant choice of a poor type of cane on account of its more favorable position. Details as to choice of position for fruiting buds are given.—Ernst A. Bessey.

3675. PETEL, O. VAN POLANEN. *Crotalaria anagyroides* en *C. usaramoensis*. [Crotalaria anagyroides and *C. usaramoensis*.] Thee 6: 52-54. 1925.—Experiments are reported in the use of these plants as green manure in tea plantations.—Carl Hartley.

3676. PHILLIPS, H. A. Effect of climatic conditions on the blooming and ripening dates of fruit trees. New York [Cornell] Agric. Exp. Sta. Mem. 59. 1379-1416. 1922.—Based on 10-year records furnished by H. P. Gould of the U. S. Dept. Agric. the relation of general climatic conditions to blooming and ripening dates of certain fruit trees has been studied. The average date for blooming is retarded 4.6 days for each degree of latitude northerly. The greatest retardation is through the Atlantic States and least in the Pacific States. Increases in altitudes bring about a retardation of 1 day for each 101 feet. In the Atlantic and Mississippi sections the rate of retardation is not constant. It is considered that conditions affecting the rest period are involved. There is more uniformity in epochs through the Pacific States than in other regions, due to prevailing westerly winds from the Pacific Ocean. The number of days for ripening of fruit is greater in the Pacific section than in the Atlantic or Mississippi sections. The author suggests that length of day is not a factor in blooming of fruit trees. In the appendix, 46 detailed tables are given bearing on the relation of latitude and altitude to the fruiting and ripening dates, etc.—Lewis Knudson.

3677. RAVAZ, L. Porte-greffes. [Stocks.] Prog. Agric. et Vitic. 75: 557-561. 1920.—The factors governing choice of stocks for vines are discussed and recommendations made.—E. L. Proebsting.

3678. RAVAZ, L., ET G. VERGE. *Sur l'influence des éléments fertilisants sur la santé de la vigne.* [Influence of fertilizer elements on the health of the grape.] *Ann. École Nation. Agric. Montpellier* 18: 237-244. *Pl. 1 (col.)*. 1925.—The intensity of the green color of grape leaves, up to the time when growth ceases, depends on the proper nitrogen: water ratio in the soil. After cessation of growth, potassium, or rather the proper potassium: calcium ratio, is the deciding factor. Vigorous stock does not show the potassium effect as clearly as a weak stock.—*F. F. Halma.*

3679. RICARD, A. *Étude sur la taille de la vigne.* [Pruning the vine.] *Prog. Agric. et Vitic.* 74: 427-429. 1920.

3680. ROBBINS, W. W., AND H. A. JONES. *Secondary sex characters in Asparagus officinalis* L. *Hilgardia* 1: 183-202. *Fig. 1-6*. 1925.—Though the asparagus plant is normally dioecious, the following flower forms are known to occur: Strongly pistillate, weakly pistillate, hermaphrodite, weakly staminate and strongly staminate. In a large number of plants observed there were virtually equal numbers of staminate and pistillate individuals. The staminate plants have a greater vegetative growth than the pistillate. Data kept during 2 seasons showed that the staminate plants produce more stalks per crown, a greater total green weight of tops (excluding berries) and that they also out-yield the pistillate plants in number and total weight of spears harvested. The average weight of individual spears, however, was greater from the pistillate plants. A bibliography is given.—*Margaret Buwens.*

3681. ROBERTS, R. H. *Factors influencing early bearing in apples.* *Amer. Fruit Grower* 45¹²: 4, 15. *Illus.* 1925.—After pointing out the erratic results obtained in trying to make apple trees bear at an early age, the author shows that the formation of blossom buds seems to be most common in twigs of considerable diameter, with large terminal leaves. Trees which are very high in N content and correspondingly low in carbohydrates were found to have dark green leaves and usually, slender, willowy growths. On the other hand, trees with very high carbohydrate content accompanied with a low N supply were found to have light green to yellowish leaves and stiff, slender growths. Trees with intermediate proportions proved most fruitful. The condition causing the additional thickening of the twigs, which is held to be correlated with fruitfulness, is said to depend upon the balanced nutrition of the tree.—*Arthur S. Rhoads.*

3682. ROBINSON, T. RALPH. *Avocado culture in Florida.* *Florida Fruits & Flowers* 34: 73-74; 35-6: 7-9. 1925.—Special reference is given to the characteristics of the West Indian, Guatemalan and Mexican races and the most promising varieties of each, interplanting or grouping of varieties according to the way in which they are capable of benefitting each other through cross-pollination, propagation, sites and soils, planting methods, fertilizing, irrigation, pruning, insect pests and fungous diseases, harvesting and marketing, and crops, prices and profits.—*Arthur S. Rhoads.*

3683. SANDS, W. N. *The Jamaican or Gros Michel banana and the pisang embun of Malaya.* *Malayan Agric. Jour.* 13: 275-276. 1925.—It is recorded that these 2 bananas are very closely alike, if not identical; a description of the fruit characters of pisang embun is given.—*R. E. Holtum.*

3684. SCHMÖLE, J. F. *Een bemestingsproef op Sumatra's Oostkust.* [A fertilizer test on the east coast of Sumatra.] *Thee* 6: 8-9. 1925.—Ammonium sulphate gave an important increase in the yield of tea while the addition of P and K produced no further increase.—*Carl Hartley.*

3685. SHAMEL, A. D. *Performance records of pruned and unpruned Washington Navel trees for a period of ten years.* *California Citrograph* 10: 414-415, 442, 443, 445. *5 fig.* 1925.—Production records for 10 years on plots that were pruned by 6 different pruners using quite different pruning systems have shown that on only one of the plots has there been an average gain in yields as compared with similarly located unpruned trees. On this plot the increased yield has averaged only 18.3 pounds per tree per year for the 10 years. On the 5 other plots the average loss in yield has been from 1.2 to 26.4 pounds. It is concluded that severe pruning should not be practised in healthy, bearing orchards and that navel orange orchards in general have suffered more from over-pruning than from lack of pruning.—*C. S. Pomeroy.*

3686. SICARD, H. *Sur la résistance a la sécheresse de divers porte greffes.* [Drought re-

sistance of different stocks.] Prog. Agric. et Vitic. 74: 256-262. 1920.—The hybrid vinifera \times rupestris stocks proved more drought resistant under the conditions studied than pure American stocks, hybrids among American species or vinifera \times Berliandieri.—E. L. Proebsting.

3687. SKINNER, L. B. Forty years of citrus development in Pinellas County [Florida]. Citrus Indust. 6¹¹: 5-6, 34. Illus. 1925.

3688. SKOTTSBERG, C. Några i Göteborgs Botaniska Trädgård odlade Juan Fernandez-arter. [Some species from Juan Fernandez, grown in the Botanic Garden, Gothenburg.] Acta Hort. Gothoburg. 1: 256-258. 1924.—The author brought seed of numerous endemic species from Juan Fernandez. Several are well established in a cold or temperate house, none being hardy. In some cases cultivation has proved very difficult as these insular endemics more easily fall a victim to fungus or insect pests than most other species.—C. Skottsberg.

3689. SWINGLE, CHARLES F. The propagation of apple varieties by cuttings. Science 62: 544. 1925.—Burr-knots found on the stems of certain varieties of apple contain root rudiments. Cuttings containing these knots give a high percentage of rooted cuttings.—C. J. Lyon.

3690. THOMAS, C. C. The Chinese jujube. (With a chapter on "The Composition of the Chinese Jujube," by C. G. CHURCH.) U. S. Dept. Agric. Dept. Bull. 1215. 1-29. Illus. 1924.—The Chinese jujube (*Ziziphus jujuba*) has been cultivated in northern China since before the Christian era for the sake of the date-like fruits which this rhamnaceous tree bears and hundreds of more or less distinct varieties have been developed. As early as 1908, Frank N. Meyer began to send to the U. S. A. propagating material of the best varieties. The fruiting of these in California and elsewhere in the southwestern U. S. A. has stimulated interest in this tree so that there has been an ever-increasing demand for plants and for information concerning the utilization of the fruits. The tree, sometimes shrubby and usually less than 40 feet in height, is very resistant to heat and drought. The fruits are usually eaten as a confection, after processing in sirup, although they may be eaten fresh, pickled, or used in a number of other ways. The immediate future of the jujube is in its culture as a home fruit in the drier regions of the southwestern U. S. A.—Paul Russell.

3691. ULTEE, A. J. Bemesting van rubbertuinen met kunstmeststoffen. [Manuring rubber plantations with artificial fertilizers.] Mededeel. Proefsta. Malang No. 50. Reprint Arch. Rubbereult 9¹: 1-7. 1925.—A uniform plot of ground was divided into 10 parcels. Five were controls, the other 5 manured at the rate of 600 gm. of superphosphate and 900 gm. of blood (12% N). The yield of the trees before manuring gave an average of 101.0. The manured trees the 1st year averaged 102.3, the 2nd year 100.5. Manuring, then, had no effect on production.—Cecil Yampolsky.

3692. UPHOF, J. C. TH. La culture du manguier dans le Sud de Floride. [Mango growing in southern Florida.] Rev. Bot. Appl. et Agric. Coloniale 3: 624-626. 1923.—Most mango trees grown for commercial purposes are found in Dade County. The varieties are propagated by budding and inarching. A number of seedling trees are found throughout the state, most of them having a considerable amount of fiber around the seed, although the flavor of many is excellent. The northern markets demand varieties that are fiberless. Trees are planted in the grove at a distance of 6 \times 6 to 7.5 \times 7.5 m. A number of varieties belonging to different groups are described.—Author.

3693. VAN HOOFF, H. W. S. Iets over Albizzia, Helopeltis en droogte. [Notes on Albizzia, Helopeltis and drought.] Thee 6: 54-57. 1 graph. 1925.—Tea under shade of *Albizzia* grows up and withstands *Helopeltis* better than without legumes. During the dry season the yield under *Albizzia* is diminished. From the relative decrease in yield under *Albizzia* between August 8 and November 8, it is concluded that the *Albizzia* is injurious to tea by competition for water. After the rains the shaded area improves with great rapidity and the unshaded very little.—Carl Hartley.

3694. VERCIER, J. Choix et greffage des sauvageons de poirier et de pommier. [Selection and grafting of seedling pears and apples.] Prog. Agric. et Vitic. 74: 300-302. 1920.

3695. VERCIER, J. N'arrachons pas nos vieux arbres fruitiers. [Do not destroy our old

fruit trees.] *Prog. Agric. et Vitic.* 75: 306-308. 1920.—This paper discusses methods of rejuvenating old trees.—*E. L. Proebsting.*

3696. VIDAL, D. Emploi comme litière des plantes spontanées des étangs et des marais du littoral Méditerranéen. [Use of wild plants of ponds and marshes of the Mediterranean littoral.] *Prog. Agric. et Vitic.* 74: 277-278. 1920.

3697. VIDAL, D. Sur les rotations de cultures complémentaires de la vigne dans le Bas-Languedoc. [Rotation of companion crops for the grape in Bas-Languedoc.] *Prog. Agric. et Vitic.* 74: 211-214, 226-232. 1920.

3698. WALKER, ROBERT SPARKS. Pecan growing in northern Georgia. *Amer. Fruit Grower* 45¹¹: 8, 17, 1925.—The author describes a large pecan orchard near the northern boundary of the state, which is said to be as old and as interesting as those in other parts of the state. Among the points covered are the beginning of the orchard, varieties planted, soil and topography, mistakes in planting, insect pests, care of the orchard, and marketing.—*Arthur S. Rhoads.*

3699. WORK, PAUL. Nitrate of soda in the nutrition of the tomato. New York. [Cornell] *Agric. Exp. Sta. Mem.* 75. 1-86. *Fig.* 33. 1924.—Tomatoes were grown in boxes of quartz sand holding about 1½ bushels, the amount of nitrate applied varying through a wide range. Plant performance was recorded by 10 different measures; 32 gm. of nitrate per box proved optimum. Higher applications were detrimental, probably due to the effect of the nitrate as an environmental factor, reducing the availability of water supplied. Nitrogen content in leaves ranged from 0.173% to 0.390% green weight. A content above 0.3% seemed essential for vigorous growth under these conditions and the low to moderate applications of nitrate sufficed. The decreasing N content in series with decreasing nitrate treatments probably represents stages in N exhaustion rather than stages directly induced by the amount applied to the soil. Nitrogen content seems to bear approximately the same relation to fruitfulness as to vegetation. There is no apparent relation between nitrate applied to soil and N content of leaves on the one hand, and carbohydrate content of plants on the other, except that carbohydrates are high in plants whose growth has been stopped by lack of nitrogen. There is no indication that high or low carbohydrate content inhibited either vegetative or reproductive activities. The data of these experiments suggest that so long as the rate of manufacture of carbohydrates is sufficient to meet current needs, the amount present does not condition the processes of vegetation and fruition. The author believes that N and carbohydrate content should be considered as separate limiting factors rather than as interdependent variables, together conditioning the activity of the plant.—*Lewis Knudson.*

3700. YOUNG, FLOYD D. Cover crops and citrus orchard temperatures. *California Citograph* 11: 2, 16-17. 5 *fig.* 1925.—The results of temperature studies during cold nights of the 1921-1922 and 1923-1924 seasons in citrus orchards with and without cover crops indicate that a cover crop increases the frost hazard, but only to a very limited extent—in most cases only from 0.3° to 0.8° at 5 feet from the ground and from 0.5° to 1.5° at 10 inches above the ground. In many cases frost damage which has been thought due to the presence of a cover crop has been found due to some other factor, and in some cases estimates of increased damage made after a cold spell have been found by later examinations or packing house records to have been erroneous.—*C. S. Pomeroy.*

MORPHOLOGY AND ANATOMY OF VASCULAR PLANTS

ARTHUR J. EAMES, *Editor*

(See also in this issue Entries 3200, 3347, 3353, 3367, 3446, 3464, 3499, 3512, 3590, 3608, 3680, 3683, 3858, 3861, 3863, 3864, 3952, 3966, 4043, 4044, 4276, 4297, 4298, 4303, 4380, 4401, 4428)

3701. ARBER, AGNES. On the squamulae intra-vaginales of the Alismataceae and Butomaceae. *Ann. Bot.* 39: 169-174. 11 *fig.* 1925.—The little squamules which occur among the leaf bases of Alismataceae and Butomaceae originate in the same way as do those of other

Helobieae. They develop from the dorsal epidermis of one leaf and become enclosed by the next leaf. They are therefore not to be described as axillary.—*W. P. Thompson.*

3702. BEXON, D. Observations on the anatomy of teratological seedlings. V. On the anatomy of some atypical seedlings of *Sinapis alba* and *Brassica oleracea*. *Ann. Botany* 39: 25-40. 66 fig. 1925.—The anatomy of polycotylous and syncotylous seedlings is described in detail and fully illustrated. Occasionally one cotyledonary strand of a polycotylous seedling fails to take part in root-pole formation. A twinned seedling of *Sinapis alba* is recorded. There is a general discussion of the value of cotyledonary strands as a criterion of the origin of cotyledons.—*W. P. Thompson.*

3703. BRIQUET, JOHN. Carpologie comparée de l'*Archangelica officinalis* Hoffm. et du *Peucedanum palustre* (L.) Moench. [Comparative carpology of *Archangelica officinalis* and *Peucedanum palustre*.] *Candollea* 1: 501-520. Fig. 1-6. 1923.

3704. BRIQUET, JOHN. Causes d'erreur dans l'étude des folioles et des segments foliaires dissymétriques sur des matériaux desséchés. [Causes of error in the study of the leaflets and asymmetric foliar segments in dried material.] *Candollea* 1: 521-524. 1923.—The author calls attention to the errors one may make in examining dried material, especially of herbaceous plants, due to torsion of the segments of dissected leaves.—*A. S. Hitchcock.*

3705. BROUWER, JACOB A. Studies in *Platanaceae*. *Rec. Trav. Bot. Néerlandais* 21: 309-382. 4 pl. 1924.—This paper is a summary of the results of a morphological study of the *Platanaceae*, undertaken because of the interest of this family as possibly primitive among the angiosperms. A more extensive account is contained in the author's dissertation "Onderzoekingen over de *Platanaceae*."—The life history of *Platanus* is briefly described. When the flower buds open, the inflorescences expand, the styles meanwhile pushing through the "roof" of anthers. Pollination takes place late in spring, and that mosquitoes have something to do with this "may not be quite improbable." The pollen has no starch. The young inflorescence has the form of a ball; its parts later become separated and form the balls of flowers and fruits commonly known as the "inflorescences." The young ball is covered by 20 rows of stamens and carpels, these organs being in pairs, a stamen and a carpel together. The author believes, on morphological and anatomical evidence, that these pairs are definite units and represent simple flowers. In the rows these pairs of organs are spirally oriented and the 2 kinds of organs alternate; thus, groups of carpels are formed surrounded by their respective stamens, groups which have always been interpreted as flowers. The author believes that these groups are not true flowers, the groups being incidental to the arrangement, crowding, and suppression of the organs. The evidence for this lies in the structures of the inflorescence as a whole, and in part in the anatomy. All the organs are developed and the flowers are fixed in position on the young inflorescence ball. This ball soon becomes lobed, its 3 or 4 lobes being spirally placed on the mother ball. The expansion of the bases of these lobes then separates them and each lobe rounds up. The "peduncle" between these balls is thus a false peduncle and the balls are false inflorescences. The course of the vascular bundles is said to be further proof of this fact, the bundles running from ball to ball, not through the peduncle with branches to the balls. The flowers of all the balls of an inflorescence are said to be always at the same stage of development, being further proof that all balls are but part of 1 fundamental ball.—The close arrangement of the organs has resulted in the suppression of many stamens or the reduction of these organs to staminodia. The balls when much reduced may be wholly staminate or wholly pistillate.—Fertilization was not observed, and it is suggested that there appears to be something abnormal in this process. The microspores develop normally, the diploid number of chromosomes being 16. At pollination time the embryo sac is still in early stages of formation. Pollen grains could not be found germinating on the stigmas but they could be readily germinated in sugar solutions in agar, except when pieces or extract of stigma were added. The mature embryo sac is normal, and an embryo and endosperm develop, yet no pollen tubes could be found; other students also have failed to find pollen tubes. The fruits are said to "set" before fertilization "all at once without any exception before fertilization can have taken place." The ripe fruits remain on the tree until spring when they fall and the seeds soon germinate. The cotyledons are often united at the base.

—The Platanaceae occupy an isolated position among the angiosperms. Their very simple flowers are perhaps primitive.—A. J. Eames.

3706. BUCHET, S. *L'hypocotyle*. Bull. Soc. Bot. France 72: 115–117. 1925.—The use of the term “hypocotyl” in ancient and recent botanical literature is discussed and an attempt is made to define the term and to justify the definitions. Embryologists who fear confusion in the use of the term must complete the definitions.—*Henri des Gayets (translated)*.

3707. BUGNON, P. *Organogénèse et déhiscence de la gousse des Papilionacées*. [Organogeny and dehiscence of the pod of the Papilionaceae.] Bull. Soc. Bot. France 72: 445–448. Fig. 1–6. 1925.—According to V. Grégoire the unicarpellary ovary of the Papilionaceae is closed from the first and there is no ventral suture; the fruit will therefore be a “pod.” In the Helleboreae the unicarpellary ovary is at first an open carpel; the edges later converge and fuse, a ventral suture being formed. The fruit will open by a single slit along this suture and is a “follicle.” Grégoire draws from these and other facts certain important conclusions concerning ontogeny and phylogeny. Bugnon, however, contests these statements, for he finds that in *Lathyrus vernus*, *Trifolium pratense*, and *Lupinus perennis* the young carpellary leaf is open, as in the Ranunculaceae.—*J. Beauverie (translated by A. J. Eames)*.

3708. CALDWELL, JOHN. *On a method of staining the vascular bundles in the living plant*. Ann. Botany 39: 212–214. 2 fig. 1925.—A petiole is cut off at the middle and the cut end inserted in the lower end of a glass tube which is then filled with stain. The plant is placed in favorable conditions for transpiration.—*W. P. Thompson*.

3709. CHAUVEAUD, GUSTAVE. *Sur les conséquences fâcheuses des séparations arbitraires en embryogénie*. [The difficulties caused by arbitrary determinations in embryology.] Bull. Soc. Bot. France 72: 118–121. 1925.—The author makes clear the vexacious consequences resulting from wholly arbitrary separations which have been made in embryo morphology between the stem and the leaf and between the layers forming these organs. In determining very early the fate of each element formed from the egg, one makes arbitrary separations between cells which are still in the embryonic stage.—*Henri des Gayets (translated by A. J. Eames)*.

3710. CHIARUGA, ALBERTO. *Embriologia delle Cistaceae* [Embryology of the Cistaceae.] Atti R. Accad. Lincei Roma (Rendiconti Cl. Sci. Fis. Mat. e Nat.) 33¹: 103–105. 1924.—Of the Cistaceae, the author has so far studied plants of the genera, *Cistus*, *Fumana*, *Helianthemum* and *Tuberaria*. In general, the process is similar for all the genera studied. The archesporium is simple except in the genus *Helianthemum*, where it is pluricellular. The development of the gametophyte is normal. Many other details are given. The fact that the archesporium is pluricellular in *Helianthemum*, the author believes might well be utilized in classification, though the sections *Fumana* and *Tuberaria* ought to be separated from the genus *Helianthemum* and raised to the dignity of genera in accord with the classification of Grosser.—*F. M. Blodgett*.

3711. DANIEL, LUCIEN. *Sur le formation de tubercules souterrains dans une greffe de topinambour sur soleil annuel*. [The formation of subterranean tubercles in a graft of Jerusalem artichoke upon the annual sunflower.] Rev. Bretonne Bot. 1: 32–34. 1922.—The development of tuber-like outgrowths apparently arising from the sunflower (hypobiotum) but in reality produced by the artichoke (epibiotum), is described. The significance of this phenomenon is very briefly discussed.—*P. D. Strausbaugh*.

3712. DOYLE, J. *An old record of the ovule of Larix*. Ann. Botany 39: 209–210. 1925.—Geleznoff (Bull. Soc. Nat. Moscou 4: 22. 1849) gave a full account of the reproductive morphology of *Larix*. This has been entirely overlooked by later writers.—*W. P. Thompson*.

3713. EAMES, ARTHUR J., AND LAURENCE H. MACDANIELS. *An introduction to plant anatomy*. xiv + 364 p. Frontispiece + 146 fig. McGraw-Hill Book Co.: New York, 1925.—The purpose of this volume is to serve not only as a text for class study in plant anatomy but also as a reference book for workers in other fields. Only vascular plants are considered. The point of view is primarily that of descriptive morphology, and facts of physiological anatomy, comparative morphology and phylogeny are introduced only when they help to elucidate existent form and structure. After an introductory chapter there follow 3 chapters on histology, including 1 on the cell, in which the cell wall is particularly emphasized; 1 on

the meristems; and 1 on the main types of tissues. The portion of the plant body consisting of primary tissue systems is then discussed, and this is followed by chapters on the secondary xylem and phloem and the periderm, with their development and their relations to the primary body. The main organs and organ systems of the plant—the root, the stem, the leaf, and the reproductive organs—have each a chapter devoted to them. The 2 concluding chapters are concerned with ecological anatomy and with the history of plant anatomy.—*E. W. Sinnott.*

3714. FRIEDEL, J., ET TSIIEN-POU-YEN. Un curieux cas de convergence morphologique, une Caryophyllée à port d'Eryngium, le *Drypis spinosa* L. Comparaison entre le *Drypis* et un *Eryngium*. [A remarkable example of morphological convergence, a Caryophyll with the aspect of *Eryngium*, *Drypis spinosa* L. A comparison of *Drypis* and *Eryngium*.] Bull. Soc. Bot. France 72: 416-422. 5 fig. 1925.—The question, does morphological adaptation produce similar changes in anatomical structure, has been studied by the authors, who state that it does not, and that adaptation from the point of view of anatomy is very different in the 2 genera. In short, no matter what the aspect of the plants, in internal structure the hereditary characters are retained in marked fashion.—*J. Beauverie (translated by A. J. Eames).*

3715. GAGNEPAIN, F. L'origine probable des variétés monophylles et hétérophylles des feuilles multifoliolées. [The probable origin of the monophyllous and heterophyllous varieties of plants with multifoliate leaves.] Bull. Soc. Bot. France 72: 123-125. 1925.—The author has studied the condition of monophyllous and heterophyllous (1-3 foliolate) varieties of *Fraxinus excelsior*, *Robinia Pseudo-Acacia*, and *Sambucus nigra*. These forms are to him a return to the juvenile state by abrupt mutation. In fact, the leaves of seedlings are even more simple than those of the juvenile state and represent a still lower foliar stage. The juvenile state, which is transitory in most individuals, becomes fixed in certain rare individuals.—*J. Beauverie (translated by A. J. Eames).*

3716. GLÜCK, H. Kritische Bemerkungen über die phylogenetische Herkunft der Monokotylen. [Critical observations on the phylogenetic origin of the monocotyledons.] Flora 118-119: 150-164. 12 fig. 1925.—Suggestions of monocotyledonous characters are seen in 3-merous flowers of the Nymphaeaceae (*Nuphar*, *Nymphaea*, *Cabomba*, *Brasenia*), and in the 3-merous bracts of *Hepatica* and *Anemone*. In *Ranunculus polyphyllus* when nutrition is poor the flowers show a reduction in parts and may have 3 petals or 3 large and 2 small petals, and 6-12 stamens in cyclic arrangement.—A close relationship is shown to exist between stipular organs of monocotyledons and dicotyledons; the leaf sheath of the former is a modification of the stipules of the latter. The stages of evolution are shown in the ontogeny of *Nymphaea alba* and *Potamogeton rufescens*. The lateral stipule is the oldest type, the second is the leaf sheath with ligule, the youngest type is the axillary stipule.—*A. G. Stoekey.*

3717. GROOM, PERCY, AND S. E. WILSON. On the pneumatophores of paludal species of *Amoora*, *Carapa* and *Heritiera*. Ann. Botany 31: 9-24. 2 pl., 10 fig. 1925.—The pneumatophores are scattered along the middle of the upper surface of long horizontal axes which extend beneath the surface of the mud in Indian saline swamps. They are peg-like, laterally compressed structures produced by localized activity of the cambium which remains continuous around and over them. At first the wood is in the form of superposed arches whose curved surfaces are in the direction of the longitudinal axis of the horizontal root. The types of symmetry become very complex with growth. Finally, the outer proximal parts become radially symmetrical with longitudinal axis of symmetry erect, while the distal parts remain bilaterally symmetrical with long axis horizontal. The rays execute remarkable twists in tangential planes. Lenticels are present; vessels are scanty and blocked by callus plugs or localized excreta; thin-walled fibers, wood parenchyma and rays make up the main mass; most cells have no solid contents and may therefore serve as air reservoirs.—*W. P. Thompson.*

3718. GUTTENBERG, HERMANN VON. Die Bewegungsmechanik des Laubblattes von *Dionaea muscipula* Ell. [The movement mechanism of the leaf blade of *Dionaea muscipula*.] Flora 118-119: 165-183. 1 fig. 1925.—The relation of the mesophyll to the epidermis is of great importance in the closing of the leaf of *Dionaea*. The mesophyll consists of a swelling tissue whose tubelike cells run lengthwise from the midrib to the margin. Their thin walls

are very elastic and the cells may increase in length 20%. At the time of stimulation the osmotic pressure increases, owing to the splitting up of substances with large molecules; it may be as great as 14 atmospheres. The cells of the lower epidermis may lengthen 6-7%, but the cells of the upper can scarcely lengthen at all. As a result the halves of the leaf bend inward.—A. G. Stokey.

3719. HALLIER, H. Zur morphologischen Deutung der Diskusgebilde in der Dikotylenblüthe. [The morphological interpretation of disk structures in dicotyledonous flowers.] Mededeel. Rijks Herb. 41: 1-14. 1919.—Porsch essayed to prove that the leaf nectaries of the Polycarpiceae and monocotyledons correspond to the typical axil nectaries of dicotyledons, and that the morphological value of the flower nectary proves on critical comparison not only a valuable phyletic characteristic but a new link in the chain of evidence of the descent of the monocotyledons from the dicotyledons. The author after a careful study of nectaries concludes that there is much doubt concerning Porsch's method of proof. He asserts that Porsch worked more with abstract conceptions than with differentiated living forms and on the basis of very poor knowledge of morphological facts. The author concludes that we must adhere to the derivation of the remaining dicotyledons and the monocotyledons from the Polycarpiceae but Porsch's work has not furnished the slightest new proof for this, as it is impossible to recognize as close relatives the genus *Caltha* and the genus *Tofieldia* of the Haemodoraceae, both of which excrete honey on the fruit receptacle, and as it is by no means yet ascertained whether among monocotyledons the saeptal or perhaps the calyx nectary is the primitive form.—M. F. L. Fitzpatrick.

3720. JONES, W. NEILSON. Rootcap development in *Calluna vulgaris*. Nature 116: 677. 1 fig. 1925.—An unusually long rootcap grown under controlled conditions is illustrated.—O. A. Stevens.

3721. KONDO, M. Ueber die in der Landwirtschaft Japans gebrauchten Samen. [The seeds used in Japanese agriculture.] Ber. Ohara Inst. Landw. Forsch. 2: 559-595. Fig. 49-68. 1925.—A descriptive study of seeds and seedlings of various Malvaceae, including *Gossypium* sp., *Abelmoschus Manihot*, *A. esculentus*, *Hibiscus cannabinus*, *H. Sabdariffa*, and *Abutilon avicennae*.—H. S. Reed.

3722. LAPIQUE, L., ET A. CHERBULIEZ. Grandeur cellulaire dans les feuilles hypertrophiées. [Cell size in hypertrophied leaves.] Ann. Physiol. et Physicochim. Biol. 1: 327-331. 1925.—In leaves of *Syringa vulgaris* and *Populus nigra* which had attained 2-2½ times normal size, there was in the poplar increase in cell number but not in cell dimensions and in the lilac increase in both number and size of cells.—Joseph S. Caldwell.

3723. LASHEVSKY, V. On the liane structure in the subterranean stem of *Daphne Julia* K. Pol. Bull. Soc. Natur. Voronège 1: 29-36. 1925.—A type of stem structure, new for the genus *Daphne* and probably for the family Thymelaeaceae, is described. The underground stem of *Daphne Julia* has an anomalous structure similar to that found in many tropical lianas. The continued growth of the parenchyma of pith, wood, and wood rays breaks up the vascular cylinder into fan-shaped strands arranged in rosettes. This type of structure is commonly supposed to be correlated with the habit of lianas, yet it is here found in the underground parts of a plant of the forest-steppe zone of Russia. The author suggests that this is an example of retention of ancestral structure underground for a long period. In the structure of its young stems *Daphne Julia* belongs to the tribe Thymelaeaceae and in that of its old stems to the Aquilarieae.—(From author's abstract.)

3724. LASHEVSKY, V. On the ovuliferous scale of the Coniferae. Acta Universitatis Voronegensis 2: 207-229. 1925.—A new solution of the ovuliferous scale problem is advanced: "The hypothesis of the shifting of the scales."—The ancestral female cone had simple scales only; all the complexity of the recent female cone is derivative. Complexity has been brought in by a shortening of the cone axis, the resultant crowding of the appendages bringing about a shifting of some scales into the axils of other scales, with subsequent greater or less fusion of the members of these pairs. The shifting of scale position has affected the anatomy also, the course of the bundles becoming meandering. The bundles of the ovuliferous scales which formerly originated separately from the bract bundle coalesce with the latter, and various stages of fusion are found. The fertile scale bundles become detached from the bract bundles

at greater distances from the axis as fusion becomes greater, and tend more and more to lose their characteristic inverse orientation. Ultimately there remains of all the bundles of the ovuliferous scale only 1 small inversely oriented branch, issuing from the bract bundle under the ovules. The tip of the ovuliferous scale remains as the ligule. The compound scales thus have the appearance of simple ones. The similarity of structure of fertile scale and bract, the tendency of these organs to fuse, and the reduction of the former to a ligule are evidence that the ovuliferous scale is a modified leaf and morphologically equivalent to the bract. The modifications of the ovulate cone are related to the protection of the macrosporangia.—The phylogenetic series in the Coniferae should read: Abietineae-Araucarineae. The higher forms approach the Angiospermae in some degree—folded, fused, colored and fleshy sporophylls; nucellar "stigma" (*Saxegothea*); germination of microspores on the scales (*Araucaria* and *Agathis*); "stigmatic" papillae (*Pseudotsuga*).—Further proof that the apparently simple scales of the higher Coniferae are derivative is found in the seed bundles, these being well developed in the Abietineae and reduced or lacking in other forms.—The ovule is attached to the under side of the wing as is the microsporangium to the underside of the microsporophyll, and the wing is perhaps a macrosporophyll. The wing is most independent in the primitive forms, the Abietineae; the wing is split off from the fertile scale just as this scale is separated from the bract; there are in the Abietineae 4 bundles supplying the fertile scale, the upper 2 of which may be the supply of a sporophyll reduced to the wing. These facts are evidence that the wing can be a macrosporophyll shifted down into the axil of the ovuliferous scale; the ancestral type of female cone will then be like the male cone, bearing simple macrosporophylls with dorsal sporangia.—(From author's abstract).

3725. McCURE, F. A. Some observations on the bamboos of Kwantung. *Lingnaam Agric. Rev.* 3: 40-47. 9 fig. 1925.—All bamboos which have been observed by the author fall into one or the other of 2 distinct groups as regards their rhizomes. The rhizomes of the "monopodial" type are indeterminate in their growth and more slender than the culms to which they give rise. The rhizomes of the "sympodial" type are determinate in their growth, and larger in diameter than the culms to which they give rise. The 2 types seem to differ radically in their preferences as to habitat; almost without exception, the monopodial bamboos grow in the mountains and the sympodial bamboos in the level places. In the propagation of the monopodial type the rhizomes are indispensable. The bamboos of the sympodial type are mostly propagated by means of material in which the rhizomes are essential, but branches may be rooted in some cases. In both of these groups are found bamboos useful with respect to culms or edible shoots or both. The shoots of the monopodial type develop about a month earlier than those of the sympodial type. The culms of both types are harvested only while no immature shoots are dependent upon them.—W. C. Lowder-milk.

3726. RECORD, SAMUEL J. Cystoliths in wood. *Tropical Woods* 3: 10-12. 1925.—"Cystoliths are of very rare occurrence in wood and are apparently limited to a single family—the Opiliaceae." Cystoliths in *Champereia manillana* Merrill from the Philippines and Formosa are described. They consist of a stalk and a body of CaCO_3 .—W. N. Sparhawk.

3727. RECORD, SAMUEL J. Occurrence of intercellular canals in dicotyledonous woods. *Tropical Woods* 4: 17-20. 1925.—Intercellular canals, commonly known as gum ducts, are useful in the identification of tropical woods. There are 2 kinds: (1) Vertical or axial ducts, of natural or pathological (gummosis) origin; (2) horizontal or radial ducts, which may be large or small. A list is given of the families and genera in which the various types of canals occur.—W. N. Sparhawk.

3728. RECORD, SAMUEL J. Pits with cribriform membranes. *Tropical Woods* 2: 10-13. 1925.—Pits with cribriform or sieve-like membranes have been reported in the secondary wood of members of 20 families of dicotyledonous plants. They are most distinct in the Combretaceae, Leguminosae, Lythraceae, Melastomaceae, Polygonaceae, Vochysiaceae, and in some of the Myrtaceae. When the perforations are distinct they are valuable aids in identification.—W. N. Sparhawk.

3729. RECORD, SAMUEL J. Secretory cells in dicotyledonous woods. *Tropical Woods* 1: 9-12. 1925.—Large, thin-walled parenchyma cells with oily or resinous contents have been

observed in certain woods of 5 families: Magnoliaceae, Anonaceae, Conellaceae, Lauraceae, and Lythraceae. Notes are given on the comparative anatomy of the woods of these families.—W. N. Sparhawk.

3730. RECORD, SAMUEL J. **Spiral tracheids and fiber tracheids.** *Tropical Woods* 3: 12-16. 1925.—Spiral thickenings of secondary origin are typical of the vascular elements of the protoxylem. Spiral thickenings of tertiary origin characterize the tracheids of *Pseudotsuga*, *Torreya*, *Taxus*, and *Cephalotaxus*, and are sporadic in *Picea* and *Larix*. They have been found in the fiber-tracheids of certain members (nearly all of them shrubs or small trees) of 16 families. In many instances their occurrence is sporadic. They have their highest diagnostic value in *Ilex* and in *Symplocus*.—From author's summary.

3731. ROSS, H. **Über die Kletterhaken einer brasilianischen Apocynaceae.** [The climbing hooks of one of the Brazilian Apocynae.] *Flora* 118-119: 453-459. Pl. 6. 1925.—The long slender climbing shoots of *Dipladenia Leutzelburgii* Ross and Markgraf have a collar at the nodes consisting of 6-8 thorn-like structures 12-15 mm. long. They are straight and soft until 8-10 mm. long; later they are recurved and become leathery through the development of a thick corky covering produced by a cambium. Comparison is made with the "intrapetiolar stipules" of *D. Martiana*.—A. G. Stokey.

3732. ROSS, H., UND K. SUESSENGUTH. **Das Apikalorgan der Blätter von Lafoensia.** [The apical organ of the leaves of Lafoensia.] *Flora* 120: 1-18. 4 fig. 1925.—The authors have investigated the structure and development of the peculiar organ found on the under side of the leaf of *L. pacari* at the apex of the midrib, and have concluded that it is a peculiar type of hydathode. Nine other species of *Lafoensia* were examined; all have the apical organ except *L. nummularifolia* in which there is a depression but not a cavity or pore.—A. G. Stokey.

3733. SAUNDERS, EDITH R. **On carpel polymorphism.** *Ann. Botany* 39: 122-168. 83 fig. 1925.—There are really 3 distinct types of carpels: (1) A valve type which retains more or less the typical leaf form, (2) a solid type derived from the valve, and (3) a semi-solid type combining some of the features of the other two. The phylogenetic history of the gynoecium is outlined from this viewpoint. A mass of evidence from a wide range of families is brought forward in support of the conception. It gives a rational explanation of many features which appear aberrant or meaningless if all carpels are regarded as monomorphic.—W. P. Thompson.

3734. SCHULTE, KARL. **Contributions to the anatomy of monocotyledonous seeds.** *Pharm. Jour.* 115: 411. 1925.—Divergent details have been published respecting the anatomy of the seeds of certain monocotyledonous families as, for instance, those of *Colchicum autumnale* and of *Schoenocaulon officinale*. No account is to be found of any description of the anatomy of these seeds based upon their development, and an attempt was therefore made to clear up the inconsistencies. At the same time the anatomy of a number of other seeds of pharmaceutical interest derived from the Liliiflorae was studied in order to construct a key for their identification that might be of use to the practical pharmacist when examining them in the powdered state. Some seeds from the family Palmae were also included, the seed of one species of which, *Areca Catechu*, is officinal (in the Swiss Pharmacopoeia), and others which are of technical importance and afford waste products are sometimes used for the adulteration of vegetable powders.—E. N. Gathercoal.

3735. SIDERIS, CHRISTOS P. **Observations on the development of the root system of Allium cepa L.** *Amer. Jour. Bot.* 12: 255-258. 1 fig. 1925.—Onion plants produce 2 sets of roots. The 1st, occupying the central part of the stem, functions from germination to bulb formation and then dies. The 2nd, from the marginal part of the stem, functions during the rest of the life of the plant.—E. W. Sinnott.

3736. STANFORD, E. E. **The inflorescence and flower-form in Polygonum, subgenus Persicaria.** *Rhodora* 27: 41-47. 1925.—Three types of flowers occur—cleistogamous, pseudo-hermaphrodite male, and pseudo-hermaphrodite female. Ordinary propagation is by the cleistogamous type. Heterostyly in American representatives of *P. amphibium* and in other groups of the genus is discussed. The short-styled form is usually infertile, while in flowers of the long-styled form the anthers are generally imperfect. This heterostyly is usually

accompanied by a segregation of the flowers of the 2 types on different plants. Propagation in this group is chiefly by the rhizomes.—*S. F. Blake.*

3737. THOMSON, R. B., AND H. B. SIFTON. Resin canals in the Canadian spruce (*Picea canadensis* (Mill.) BSP.)—An anatomical study, especially in relation to traumatic effects and their bearing on phylogeny. Phil. Trans. Roy. Soc. London, B. 214: 63-111. 7 pl., 6 fig. 1925.—No instance of anastomosis of the primary cortical resin canals with those of the adjacent bast has been found in the stem, even where wounding has produced an excessive number of canals. In the root, primary cortical resin canals are wanting. In the stem and seedling root there is no anastomosis of the vertical and horizontal system, or between canals of wood and bast. Some anastomosis occurs in distal roots of mature trees.—Details are given of the canals in the cortex and bast; in the latter they are only horizontal, in secondary medullary rays. Resin canals owe their origin to wounds or other stimulation of the cambium. The position and frequency of canals in different positions during the life of the tree is discussed. The body of evidence from *Picea* favours the hypothesis of a phylogenetic increase of sensitiveness to wound stimuli among conifers.—*W. R. G. Atkins.*

3738. YAMPOLSKY, CECIL. A contribution to the study of the oil palm, *Elaeis guianensis*. Bull. Jard. Bot. Buitenzorg III, 5: 107-174. Pl. 1-17, fig. 55-57. 1922.—A detailed study of the morphology, anatomy and physiology of the oil palm.—*Alfred Rehder.*

MORPHOLOGY AND TAXONOMY OF ALGAE

WM. RANDOLPH TAYLOR, *Editor*

(See also in this issue Entries 3334, 3350, 3353, 3355, 3356, 3382, 4056, 4061, 4106, 4226)

3739. C., G. H. A new schedule for mounting filamentous algae. Turtlox News 3: 45-48. 1925.—Fixation is made with Rawlins Formol-acetic-alcohol, with which *Cladophora* is the only genus showing occasional plasmolysis. Washing is done in running fresh water, followed by distilled water, after which the specimens are mordanted in 4% iron alum for 12 hours, followed by rinsing in distilled water, washing in tap water for 30 minutes and staining in a 1% aqueous solution of Haematoxylin for 12 hours. The material is then rinsed and de-stained in 4% iron alum for 3-10 minutes, or with a weaker solution for more prolonged periods. After staining, the material is rinsed in distilled water, washed thoroughly in tap water and placed in 10% glycerine which is allowed to concentrate in the cold or at 40°C. The concentrated glycerine is washed off with absolute methyl alcohol to which is added a very little Light Green stain. Transfer is made to Venetian Turpentine, which is allowed to concentrate in a dessicator, and in which it may be finally mounted, or the material may be transferred to Canada Balsam. The use of a centrifuge and the settling method is recommended for Volvocales and other unicellular types.—*Wm. Randolph Taylor.*

3740. CROW, W. B. Variation in the hormogones of *Lyngbya nigra* Ag. Jour. Roy. Microsc. Soc. London 1925: 37-42. 1 fig. 1925.—Hormogones of *Lyngbya nigra* vary in length, consisting of 1-60 segments in the cultures studied. In some, separation discs were observed, so that in these cases the structures were really made up of 2 or more short hormogones. The nature of the separation discs is briefly discussed.—*Ralph E. Cleland.*

3741. DEFLANDRE, GEORGES. Addition à la flore algologique des environs de Paris. [Additions to the algal flora of the Paris neighborhood.] Bull. Soc. Bot. France 72: 119-213. 1925.—The author presents a sketch of the contents of ponds in the vicinity of Rambouillet. The streams and the basin in the park are fed artificially, the 1st by residual water filtered from the town, the 2nd by a pump. The shallow, muddy and exposed basin has a practically negligible vascular flora. The other stations occur in siliceous ground under conditions which favor a rich algal flora. Conditions for algal life in a recent pool are different from those in an old one. In the development of the algal flora of a new pool certain rare species predominate at first, while many common forms are absent. On the other hand, after drying up, only the most robust forms persist to appear in the new flora. At the end of the 1st section the author reviews his 3 papers on the Protococcales, Desmidiaceae and Flagellatae of the Rambouillet region. These give for the 3 groups a total of 286 species, of which

20 are new, and 96 had not previously been reported for France. The basin and the stream offer a *Scenedesmus* association. Five ponds have an abundant desmid and flagellate plankton; temporary drying of these does not have a retrogressive influence. Two ponds show a flagellate association, and one seems to be intermediate between these and the siliceous ponds of Vexin. While the differences between ponds are great, they show a cosmopolitan group of flagellates, some of which may perhaps in the future become localized.—*Henri des Gayets (translated)*.

3742. DEFLANDRE, GEORGES. Note sur la flore algologique de deux localités alpines. [Note on the flora of two alpine localities.] Bull. Soc. Bot. France 72: 373-392. Fig. 1-31. 1925.—An excursion was made on the 26th of August, 1924, to the Lac de Tavaneuse (Haute Savoie) and to a neighboring lake with peat-moss. As new for France there are reported 7 species, and as new for the Haute Savoie, 35. Desmids predominate. A list is given of the algae collected, with observations on some species, notably *Anisonea alpinum* n. sp. The flora of the district is not homogenous, but consists of a complex of associations. A special study was made of the desmids of the "Closterium communis" association.—*J. Beauverie (translated)*.

3743. GRIER, N. M. The native flora of the vicinity of Cold Spring Harbor, Long Island, New York. Amer. Midland Nat. 9: (1-265). 1925.—This is a compiled list of the plants of the district named, including the Schizophyta, Flagellatae, Dinoflagellatae, Bacillariophyta, Conjugatae, Chlorophyceae, Charophyta, Phaeophyceae, and Rhodophyceae. The fossil flora is also recorded, including the Bacillariophyta. A partial bibliography of the botanical literature of the district is appended.—*Wm. Randolph Taylor*.

3744. FRITTSCH, F. E. [Rev. of: PASCHER, A. (editor). Die Süßwasserflora Deutschlands, Österreichs und der Schweiz. (Fresh-water flora of Germany, Austria and Switzerland.) Gustav Fischer: Jena, 1913-1925. (See Bot. Absts. 13, Entry 5140; 15, Entries 1835, 1836.)] Nature 116: 743, 1925.

3745. GRÖNBLAD, ROLF. Einige Desmidiaceen aus Sibirien. [Some Desmids from Siberia.] Soc. Sci. Fennica Comment. Biol. 1: 8-9. 6 fig. 1924.—By examining 14 samples from the neighborhood of Jenisey and Ob the author has found 93 species and 14 varieties. For some of them critical remarks are added. There is also given an account of the various associations found in the samples.—*Fredr. Elfving*.

3746. GRÖNBLAD, ROLF. New desmids from Finland and Northern Russia. Acta Soc. Fauna et Flora Fennica 49: 1-78. 7 pl. 1921.—Descriptions in Latin are given of the followings new species, varieties and forms: *Closterium tumidum* var. *nylandicum*, *C. spetsbergense* var. *laticeps*, *Euastrum insulare* var. *excavatum*, *E. Turneri* var. *karelicum*, *E. Boldtii* var. *isthmochondrium*, *E. pseudoboldtii*, *E. pulchellum* var. *subabruptum*, *E. denticulatum* var. *angusticeps*, *E. sibiricum* fa. *exsecta*, *E. binale* var. *pseudogutwinski*, *E. mononcyllum* var. *polonicum* fa. *fennica*, *E. verrucosum* var. *subplanctonicum*, *Cosmarium Cedercreutzii*, *C. calamistratum*, *C. pseudopromontorium*, *C. Blythii* var. *pseudorichmondiae*, *C. seznotatum* var. *denotatum*, *C. abscissum* and var. *subetchachanense*, *C. perincisum*, *C. miraculum*, *C. sphagnolicum* var. *incisum*, *C. polygonum*, var. *hexagonum*, *C. pseudoretusiforme*, *C. pygmaeum* var. *atumidum*, *C. venustum* var. *laticeps*, *C. subtile* var. *subsparsopunctatum*, *C. angulosum* var. *scrobiculatum* and var. *tumescens*, *C. quadratum* var. *sublatiforme*, *C. pseudooctangulare*, *C. miedzyrzense*, *C. angulare* var. *bicostatum*, *C. pseudotynecense*, *C. enontekiense*, *Xanthidium pseudobengalicum*, *X. fasciculatum* var. *longispinum*, *X. concinnum* var. *varians*, *Staurastrum pachyrhynchum* var. *uhtuense*, *S. geminatum* var. *heteracanthum*, *S. Cedercreutzii*, *S. polymorphum* var. *pygmaeum*, *S. bicornae* var. *quadrididum*, *S. uhtuense*, *S. pseudoiotanum*, *S. tetracerum* var. *biverruciferum* and var. *subexcavatum*, *Hyalotheca indica* var. *fennica*.—Also numerous remarks are given as to characters and synonymy of various species and forms, especially of *Micrasterias*, *Xanthidium* and *Euastrum*.—*Fredr. Elfving*.

3747. GRÖNBLAD, ROLF. Observations on some Desmids. Acta Soc. Fauna et Flora Fennica 55: (1-18). 2 pl. 1924.—The author points out that the parietal chloroplast in no way can be characteristic for the genus *Pleurotaenium*. Some forms which certainly are true *Pleurotaeniums* have an axile chloroplast in like manner as some smaller species of *Staurastrum*, *Cosmarium*, *Xanthidium* and *Closterium*, in which genera the chloroplast gen-

erally is parietal. A new diagnosis of this genus is proposed.—Further, he gives critical remarks on some less known desmids and descriptions of some new forms, namely, *Euastrum kuusamoëense*, *Micrasterias tropica* var. *kuusamoëense*, *Cosmarium furcatospermum* var. *tumidum*, *C. pseudoerigium* var. *hexagonum* and *C. pulchellum* var. *trapezicum*.—Fredr. Elfving.

3748. HÄYRÉN, ERNST. *Aphanothece protohydrae* n. sp. *Acta Soc. Fauna et Flora Fennica* 52: —. 1923.

3749. HÄYRÉN, ERNST. *Melosira granulata* var. *angustissima* i botaniska trädgården i Helsingfors. [*Melosira granulata* var. *angustissima* in the Botanical Garden at Helsingfors.] *Nuova Notarisia* 36: 151-152. 1925.—This characteristically tropical form has developed abundantly in the Nymphaeaceae pool of the smaller hot-house in the Botanical Garden in Helsingfors. The alga, which had been introduced with tropical plants, has found a good growth environment in the warm water.—Author (translated).

3750. LONGLEY, W. H., W. L. SCHMITT, AND W. R. TAYLOR. Observations upon the food of certain Tortugas fishes. *Carnegie Inst. Washington Yearbook* 24: 230-232. 1925.—From observations made on the alimentary contents of a series of fishes, suggestions are offered concerning their movements and feeding habits, and the dependence of the various species on other fish, crustacea and algae. Most of the data are of zoological interest. The Tangs (*Teuthis coeruleus* and *T. hepatus*) often feed together, but it appears that *T. hepatus* feeds upon algae with the addition of 75%-95% of sand, while *T. coeruleus* does not ingest this foreign material. Further, the plants in the stomachs of *T. hepatus* indicate that it feeds on shorter, turf-forming algae which are often covered with sand, while *T. caeruleus* feeds in somewhat deeper water on algae which project far above the sand surface.—Wm. Randolph Taylor.

3751. LOWE, C. W. The freshwater algae of central Canada. *Proc. Trans. Roy. Soc. Canada* III, 18: 19-50. 4 pl. 1924.—This is the first study of the algae of Central Canada and deals especially with the Lake Winnipeg and the Lake of the Woods districts. The work is partly ecological. The noticeable difference in the plankton and the geological history of the lakes is compared to the differences in some Irish and Scottish lakes. There are recorded 246 species from 100 genera, and many for the first time in Canada. *Staurastrum leptocladum* Nordst. var. *canadense* and var. *curvatum* are described as new.—Author.

3752. MANN, ALBERT. Continuation of investigations and preparations for publication of results of work on Diatomaceae. *Carnegie Inst. of Washington Yearbook* 24: 283-284. 1925.—This is a progress report, indicating that publications had been prepared upon diatoms from Spokane, Washington; Penikese Island, Massachusetts; Utah; the Canadian Arctic Expedition, and the Philippine Islands. Work on the diatoms of Woods Hole, Massachusetts was continued, and work begun on those of Dry Tortugas, Florida.—Wm. Randolph Taylor.

3753. SMITH, G. M. Phytoplankton of the inland lakes of Wisconsin. Part 2, Desmidiaceae. *Wisconsin Geol. Nat. Hist. Surv., Bull.* 57: 1-227. Pl. 52-88, 17 fig. 1924.—This is a general taxonomic report on the plankton of Wisconsin lakes, including reports on abundance at the several localities and much detailed information on habit, and critical features of systematics and variation. Keys and full descriptions are important features of the publication and almost all species are figured. As new there occur: *Pleurotaenium Trochiscum* var. *tuberculatum* n. var., *Cosmocladium Hitchcockii* (Wolle) n. comb., *Xanthidium armatum* var. *mediolaeve* n. var., *X. subhastiferum* var. *Johnstonii* (W. & G. S. West) n. comb., *Staurastrum subgrande* var. *minor* n. var., *S. brevispinum* var. *tumidum* n. var., *S. aristiferum* var. *indentatum* n. var., *S. curvatum* var. *elongatum* n. var., *S. breviaculeatum* n. sp., *S. spiculiferum* n. sp., *S. pseudopelagicum* var. *tumidum* n. var., *S. Bullardii* n. sp., *S. anatinum* var. *denticulatum* n. var., *S. contortum* n. sp., *S. Chaetoceras* (Schröder) n. comb., *S. Johnsonii* var. *depauperatum* n. var., *S. urinator* n. sp., *S. subnudibrachiatum* var. *incisum* n. var., *S. inconspicuum* var. *planctonicum* n. var., *S. ankyroides* var. *pentacladum* n. var., *S. limneticum* var. *cornutum* n. var., *S. tohopekaligense* var. *brevispinum* nom. nov., *S. furcigerum* var. *armigerum* fa. *gracillimum* n. fa., *Arthrodesmus subulatus* var. *Nordstedtii* n. var., *A. Ralfsii* var. *Brebbissonii* (Racib.) n. comb., *A. incus* var. *praelongus* n. var., *A. triangulatus* var. *rotundatus* (Racib.) n. comb., and *Sphaerosozma excavata* var. *Westii* n. var.—Wm. Randolph Taylor.

3754. TAHARA, M., AND N. SHIMOTOMAI. Mitosen bei *Sargassum*. [Mitosis in *Sargassum*.] Sci. Rept. Tohoku Imperial Univ. IV, 1: 189-192. 2 fig. 1925.—Studies were made at Misaki, at the Biological Station, Univ. of Tokyo. The development of the oogonia of his plant is in general periodic and simultaneous. As a result, desired stages can only be had at certain hours on definite days. It was found that the meiotic stages of the oogonium nucleus could be had in the daytime as well as at night. *Sargassum enerve* was the plant used. The first 2 mitoses in the oogonium are typically meiotic. Centrosomes are present at the poles of the spindle, and there are 32 pairs of chromosomes present. Somatic divisions are found in the embryos, but the count cannot be made with exactness. Further studies were made at the Biological Station, Univ. of Tokyo, at Asamushi, using *Sargassum tortile*. Of the 8 nuclei formed, 7 degenerate; the remaining nucleus then undergoes another mitosis.—*Wm. Randolph Taylor*.

3755. TAYLOR, WM. RANDOLPH. Second report on the marine algae of the Dry Tortugas. Carnegie Inst. Washington Yearbook 24: 239-240. 1925.—Dredging operations were continued around Loggerhead Key, indicating that toward the northeast end on a sandy bottom in shallow water the dominant flora was of *Hypnea*, *Spyridia*, *Centroceras* and *Padina*, while on the southeast end in water of the same depth on a rocky bottom Gorgonians and *Dictyota* predominated. In somewhat deeper water a belt of *Thalassia* surrounded the island, and beyond it on a hard bottom Gorgonians with *Dictyotas*, *Gracilarias* and *Halimeda* extended into deep water. On the margins of Southwest Channel important beds of *Halophila* occur; notable records include *Dictyopteris plagiogramma*, *Caulerpa Webbia* and a form of *Caulerpa Vickersae*. A study was made in comparison of the west and east shores of Loggerhead Key near low tide mark, indicating important differences in the flora. A resurvey of the flora of Garden Key showed that no fundamental changes had occurred in the interval since the studies of 1924, but certain striking species, such as *Dictyota cervicornis* and *Heterosiphonia Gibbesii*, were more abundant. A special study was made of the deep-water distribution of the genus *Caulerpa* in Southwest Channel.—*Author*.

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 3281, 3282, 3283, 3284, 3289, 3304, 3327, 3328, 3353, 3405, 3410, 3620, 4064, 4171, 4226, 4408)

3756. ALLORGE, PIERRE. Le *Fontinalis Duriae* Schimp. dans les Hautes-Alpes [France]. [Fontinalis *Duriae* in the Hautes-Alpes.] Bull. Soc. Bot. France 70: 254-255. 1923.—*Fontinalis Duriae* is reported from near Mont-Dauphin at 900 m. The species is primarily Mediterranean in its distribution, and a complete list of its stations in France is given.—*A. W. Evans*.

3757. ANDRES, H. Beobachtungen an *Buxbaumia aphylla* L. [Observations on *Buxbaumia aphylla*.] Hedwigia 65: 341-348. Fig. 1-2. 1925.—The author discusses the occurrence of *Buxbaumia aphylla* in the vicinity of Bonn, Germany, and shows that it has persisted in certain localities for many years. In 1924, when the species was particularly abundant, he observed a number of capsule abnormalities. Some of these were associated with shriveling, in which case the spore sac sometimes developed normally and sometimes failed to develop at all. Much variation in size and form was likewise observed: One developed radially instead of dorsiventrally; another showed 2 distinct beaks, 1 in the normal position and the other arising from the dorsal surface. The author also describes the natural habitats of *B. aphylla* and *B. viridis*, giving full lists of stations in the vicinity of Bonn.—*A. W. Evans*.

3758. ARMITAGE, ELEANORA. Carnarvonshire *Sphagna*. Jour. Botany 62: 354. 1924.—Ten forms of *Sphagnum* from Cwm Idwal, Carnarvonshire, Wales, are recorded, *S. bavaricum* var. *mesophyllum* Warnst. representing an addition to the British flora.—*A. W. Evans*.

3759. ARMITAGE, ELEANORA. Report of the Ross Meeting of the British Bryological Society. Bryologist 28: 78. 1925.—From Herfordshire, England, 27 species are listed.—*A. W. Evans*.

3760. ARMITAGE, ELEONORA. The harpidioid *Hypna* of Herefordshire. Jour. Bot. 62: 344-347. 1924.—The author revises the harpidioid *Hypna* of Herefordshire, England, according to the recent researches of Renauld, Loeske and Wheldon, listing 11 species for the County and recognizing a number of subspecies and varieties, so that the number of forms totals 30, each accompanied by data regarding stations and collectors.—A. W. Evans.

3761. [BROTHERUS, V. F.] Броте́русъ, В. Ф. Мхи (Bryales). Часть II. [Mosses (Bryales). Pt. 2.] In: [ФЕДЧЕНКО, В. А.] Федченко, В. А. Флора Азиатской Россіи Выпускъ [Flora of Asiatic Russia.] Fasc. 13. P. 81-182. Fig. 12-27. Petrograd, 1918.—The 1st part of this work, dealing with the Andreaeales and 15 genera of the Bryales, was published in 1914. In this, the 2nd part, the treatment of the Bryales is continued, 17 genera and 60 species being described, with the inclusion of artificial keys wherever necessary. The following are proposed as new: *Barbula rigidula* var. *campicola* Broth.; *Molendoa Sendtneriana* var. *transcaspica* Györfy, and *M. seravschanica* Broth. & Györfy. With the exception of the botanical names, the references to the literature, and the Latin diagnoses of the new species and varieties, the work is entirely in Russian, having been translated from the German manuscript of the author. The review by Savicz (see this issue, Entry 3794) has been of great service in the preparation of this abstract.—A. W. Evans.

3762. BROTHERUS, V. F. Musci (Laubmoose) 2 Hälfte. Musci. III. Unterklasse Bryales. II. Spezieller Teil. [Special part, continued.] In: ENGLER, A., UND K. PRANTL. Die natürlichen Pflanzenfamilien. 2nd ed. Vol. 11. P. 1-542. Fig. 421-796. 1925.—In the 10th volume of this series the author began the taxonomic treatment of the Bryales (see Bot. Absts. 14, Entry 4438). In the present volume he concludes the section on the Eubryinales and discusses in addition the Buxbaumiinales and the Polytrichinales, thus completing the entire group of the Bryales. A short section on fossil mosses, a series of additions and corrections, and an index to Vols. 10 and 11 occupy the remaining pages. The concluding orders of the Eubryinales are the following, figures in parentheses indicating number of genera: Isobryales, with the families Erpodiaceae (5), Ptychomitriaceae (3), Orthotrichaceae (14), Helicophyllaceae (1), Rhacopilaceae (2), Fontinalaceae (6), Climaceae (2), Hedwigiaceae (6), Cryphaeaceae (11), Leucodontaceae (7), Cyrtopodaceae (3), Ptychomniaceae (7), Lepyrodontaceae (1), Prionodontaceae (2), Rutenbergiaceae (1), Trachypodaceae (5), Myuriaceae (2), Pterobryaceae (22), Meteoraceae (16), Phyllogoniaceae (3), Neckeraaceae (17), Lembophyllaceae (12), and Echinodiaceae (1); Hookeriales, with the families Nemataceae (1), Pilotrichaceae (2), Hookeriaceae (34), Symphyodontaceae (1), Leucomiaceae (2), and Hypnoterigiaceae (5); and Hypnobryales, with the families Theliaceae (3), Fabroniaceae (16), Leskeaceae (9), Thuidiaceae (17), Amblystegiaceae (16), Brachytheciaceae (23), Entodontaceae (14), Plagiotheciaceae (7), Sematophyllaceae (36), Hypnaceae (31), Rhytidiaceae (8), and Hylacomiaceae (7). The Buxbaumiinales are made up of the single order Buxbaumiales, with the families Buxbaumiaceae (1) and Diphysiaceae (2), while the Polytrichinales include 2 orders: Polytrichinales, with the single family Polytrichaceae (14), and Dawsoniales, with the single family Dawsoniaceae (1). Numerous genera (with dates of publication), not recognized in the 1st edition, are included. A list of these follows, the number of species in each being given in parentheses and genera proposed as new being indicated by black face type: *Abietinella* C. Müll. (3); *Acanthocladiella* Fleisch. (1); *Acanthorrhynchium* Fleisch. (32); *Acroporium* Mitt. (54); *Allioniella* Broth. (1); *Aptychella* Herz. (11); *Aptychopsis* (Broth.) Fleisch. (3); *Atrichopsis* Card. (1); *Boulaya* Card. (2); *Eidleria* Loeske (3); *Brotherella* Loeske (29); *Bryosedgwickia* Card. & Dix. (2); *Calliergonella* Loeske (1); *Campylophyllum* (Schimp.) Fleisch. (1); *Chaetomitriopsis* Fleisch. (1); *Clastobryella* Fleisch. (10); *Clastobryophilum* Fleisch. (3); *Cratoneuropsis* (Broth.) Fleisch. (3); *Cryphaeophilum* Fleisch. (1); *Ctenidiadelphus* Fleisch. (2); *Cyathophorella* (Broth.) Fleisch. (15); *Cyrtodon* Par. (6); *Dimorphocladon* Dix. (1); *Dolichomitriopsis* S. Okam. (1); *Dolichotheca* (Lindb.) Fleisch. (3); *Ectropotheciella* Fleisch. (2); *Ectropotheciopsis* Fleisch. (2); *Elmeriobryum* Broth. (3); *Entodontella* Broth. (1); *Eucatagonium* (Broth.) Fleisch. (10); *Eurhynchiella* Fleisch. (11); *Felipponea* Broth. (1); *Flabellidium* Herz. (1); *Glossadelphus* Fleisch. (32); *Hageniella* Broth. (1); *Handeliobryum* Broth. (2); *Harpophyllum* Spruce (1); *Herzogiella* Broth. (1); *Heterophyllum* (Schimp.) Kindb. (12); *Hylacomiastrum* Fleisch. (3); *Hylacomiop-*

sis Card. (1); *Ishibaea* Broth. (1); *Isodrepanium* E. G. Britton (1); *Juratzkaea* Lor. (3); *Lep- tocladiella* Fleisch. (1); *Leptodictyum* (Schimp.) Warnst. (17); *Leptopterigynandrum* C. Müll. (2); *Lepyrodontopsis* Broth. (1); *Leratiella* Broth. & Syd. (1); *Leskeadelphus* Herz. (1); *Lesquereuxia* Lindb. (3); *Loeskeobryum* Fleisch. (2); *Lopidium* Hook. f. & Wils. (16); *Macro- thamniella* Fleisch. (1); *Mandoniella* Herz. (1); *Meteoriella* S. Okam. (3); *Microctenidium* Fleisch. (1); *Micromitrium* (Mitt.) Schimp. (19); *Myrinia* Schimp (2); *Nanobryum* Dix. (1); *Orontobryum* Mitt. (2); *Orthorrhynchidium* Ren. & Card. (1); *Osterwaldiella* Fleisch. (1); *Pireella* Card. (14); *Pilosium* C. Müll. (6); *Plagiotheciella* Fleisch. (3); *Plagiotheciopsis* Broth. (2); *Plasteurhynchium* Fleisch. (3); *Platygyriella* Card. (1); *Platyhypnidium* Fleisch. (20); *Pleurozium* Mitt. (1); *Porotrichopsis* Broth. (1); *Pseudodimerodontium* Broth. (2), based on *Schwetschkea* sect. *Pseudodimerodontium* Broth.; *Pseudohypnella* (Broth.) Fleisch. (1); *Pseudorhacelopus* Broth. (1); *Pseudoscleropodium* (Limpr.) Fleisch. (3); *Pseudostereodon* (Broth.) Fleisch. (1); *Pterobryidium* Broth. & Watts (1); *Ptychomitrium* (Bruch) Fűrnr. (62); *Pylaisiadelpha* Card. (2); *Pylaisiobryum* Broth. (1); *Rhacelopodopsis* Thér. (1); *Rhacopilop- sis* Ren. & Card. (1); *Rhaphidorrhynchium* Besch. (100); *Rhaphidostichum* Fleisch. (21); *Rhizofabronia* Fleisch. (3); *Rhizohypnella* Fleisch. (1); *Sakuraia* Broth. (1); *Schraderobryum* Fleisch. (4); *Schröterella* Herz. (1); *Sciaromiopsis* Broth. (2); *Sciuroleskea* Hampe (2); *Scor- pidium* (Schimp.) Limpr. (2); *Sphaerotherciella* Fleisch. (1); *Stenocarpiopsis* Fleisch. (2); *Stenotheciopsis* Fleisch. (1); *Stereodontiopsis* Williams (1); *Stroemia* Hag. (2); *Taxiphyllum* Fleisch. (15); *Tetracladium* (Mitt.) Fleisch. (2); *Tetraphidopsis* Broth. & Dix. (1); *Tetra- stichium* (Mitt.) Card. (1); *Thamniopsis* (Mitt.) Fleisch. (1); *Thuidiopsis* (Broth.) Fleisch. (19); *Tomenthypnum* Loeske (1); *Trachythecium* Fleisch. (5); and *Wernerobryum* Herz (1). The following genera, on the other hand, although admitted into the 1st edition, are not recognized: *Aulacomitrium* Mitt. (included under *Glyphomitrium*), *Dimorphella* Ren. & Card. (supplanted by *Rhacopilopsis*), *Hemiragis* (Brid.) Besch. (supplanted by *Harpophyl- lum*), *Leratia* Broth. & Par. (supplanted by *Leratiella*), *Oedicladium* Mitt. (included under *Myurium*), *Pirea* Card. (supplanted by *Pireella*), and *Rhaphidostegium* (Bryol. Eur.) De Not (included under *Sematophyllum*). *Entodontella Cameruniae* Broth. of the Cameroons is proposed as new; and many new combinations are made. As in Vol. 10 most of the illustra- tions are reproduced from the 1st edition.—A. W. Evans.

3763. BROTHERUS, V. F. Musci nonnulli chilenses a C. Skottsberg anno 1917 lecti. [Some Chilean mosses collected in 1917 by C. Skottsberg.] Acta Hort. Gothoburg. 1: 189-195. 1924.—The author enumerates 34 mosses from central Chile, the following being proposed as new: *Fissidens diversiformis*, *Thysanomitrium laetevirens*, *Tortula flavipes*, *T. perarmata*, and *T. santiagensis*.—C. Skottsberg.

3764. BROTHERUS, V. F. Tahitian mosses collected by W. A. Setchell and H. E. Parks. Univ. California Publ. Bot. 12: 45-48. 1924.—The author lists 23 species and varieties of mosses from Tahiti. No new species are proposed.—W. A. Setchell.

3765. DAVY DE VIRVILLE, ADRIEN. Remarques sur la présence du *Dumortiera irrigua*, à Bagnères-de-Bigorre, et sur la flore d'un ruisseau d'eau thermale. [Notes on the presence of *Dumortiera irrigua* at Bagnères-de-Bigorre and on the flora of a brook of hot water.] Bull. Soc. Bot. France 70: 932-935. 1923.—The author notes that the only known station in France for *Dumortiera irrigua* is at Bagnères-de-Bigorre, in the Pyrenees, where it was discovered by Spruce in 1845. He associates the ability of this tropical hepatic to maintain itself in this mountainous locality with the fact that it grows on the banks of a brook fed by a hot spring. He then discusses the phanerogams growing under similar conditions, mentions a number of them by name, and points out some of their distinctive peculiarities.—A. W. Evans.

3766. DEGEN, ÁRPÁD. A *Riccia Frostii* Austin, R. *commutata* Jack és *Ricciocarpus natans* (L.) Corda előfordulása Budapest környékén. [The occurrence of *Riccia Frostii*, R. *commutata* and *Ricciocarpus natans* in the vicinity of Budapest.] Bot. Közlem. 20: 82-84. 1922.

3767. DIXON, H. N. High altitudes of mosses. Jour. Bot. 62: 277. 1924.—The author shows that "certain of the altitudes given for" *Orthotrichum* on Mt. Chimborazo, Ecuador (see following Entry), were "over-estimated, probably by about 1000 feet."—A. W. Evans.

3768. DIXON, H. N. Miscellanea Bryologica.—IX. Jour. Botany 62: 228-236. 1924.—In the present number (see also Bot. Absts. 13, Entry 2655, the author first records *Bryum*

pallens and *Hygroamblystegium filicinum*, 2 widely distributed mosses, from the Hindu Kūsh Mountains of India, at an altitude of 18,900 feet, one of the highest altitudes at which mosses have been gathered. He notes, however, that specimens of *Orthotrichum apiculatum* Mitt., collected at a reputed altitude of 19,000 feet on Mt. Chimborazo, Ecuador, are in the Hooker Herbarium. He next discusses the synonymy of *Chilothele chilensis* (Mont.) Broth. (*Trichostomum chilense* Mont.) of Chile and New Zealand, including under it *C. novae-seelandiae* Broth. He shows that *Tortula chilensis* Mitt. of the Andes is a true *Trichostomum* but different from *Trichostomum chilense* Mont., with which Mitten confused it, and proposes it as a new species under the name *T. aequitoriale* (Spruce) Dixon. The discussion of *Fissidens linealis* Bryol. Eur. of Africa and *F. linearis* Brid. of Australia shows that *F. linealis* is a synonym of *F. fasciculatus* Hornsch. and that the identity of *F. linearis* is still uncertain. *Garovaglia tortifolia* Mitt., of Ceylon and Borneo, which is next considered, is shown to be a true *Garovaglia* and not an *Endotrichella*, as Brotherus supposed. It is shown that *Barbula torquescens* Schimp. of the Cape is a synonym of *Tortula pilifera* Hook. and that *Rhynchostegiella convolutifolia* (Hampe) Broth. of Australia should be known as *R. cucullata* (Mitt.) Dixon, n. comb., being a synonym of the older *Hypnum cucullatum* Mitt. It is next demonstrated that *Stereophyllum pallidifolium* Ren. & Card. of West Africa is probably a synonym of *S. nitens* Mitt. and that *Bartramia afro-uncinata* C. M. of Africa is identical with *Philonotis androgyna* (Hampe) Jaeg. A description of the peristome of the Indo-Malayan *Arthrocnurus Schimper* Doz. & Molk. concludes the paper.—A. W. Evans.

3769. D[IXON], H. N. [Rev. of: BROTHERUS, V. F. *Die Laubmoose Fennoskandias*. (Mosses of Finland and Scandinavia.) *Flora Fennica* 1. 8 vo. xiii + 635 p., 118 fig. Helsingfors, 1923. (See Bot. Absts. 13, Entry 7183.)] *Jour. Botany* 62: 215-216. 1924.—The reviewer highly commends the work but calls attention to the omission of critical and descriptive notes; the too close adherence to Hagen's system of classification, which sometimes violates the grouping of genera; and the adoption of certain names antedating the work of Hedwig, in spite of the decision of the Brussels Conference.—A. W. Evans.

3770. D[IXON], H. N. [Rev. of: ENGLER, A. (Editor.) *Die natürlichen Pflanzenfamilien*. 10. Band. Musci (Laubmoose) 1. Hälfte. 2nd ed. (The natural families of plants. Vol. 10. Musci, 1st Half.) Wilhelm Englemann: Leipzig, 1924.] *Jour. Botany* 62: 282-284. 1924.—[See Bot. Absts. 14, Entries 4437, 4438, 4457, 4459, 4460, 4461, 4462, 5107.] The reviewer emphasizes the importance of the present volume for students of the moss-flora of the world. He notes that many more species are included than in the 1st edition, in spite of which the number of pages has actually been reduced. He regrets the abbreviated bibliography, the insufficient use of page headlines, and (above all) the absence of figures illustrating the new genera.—A. W. Evans.

3771. DOUIN, ROBERT. *L'anatomie du gamétophyte et la systématique dans les Marchantiales*. [Anatomy of the gametophyte and taxonomy in the Marchantiales.] *Bull. Soc. Bot. France* 61: 715-724. 1924.—This paper is a critical review of an article on the gametophyte of the Marchantiales, published by AIMÉ LAMOTHE in 1919 (see Bot. Absts. 14, Entry 4448). It is shown that certain of the anatomical characters, which Lamothe described as constant, are subject to great variation and can not be employed in distinguishing species, as he recommended. It is shown further that the subfamily Tesselinoidées, proposed by Lamothe, has no justification, that some of his reductions and transferences from 1 genus to another are based on incorrect observations, and that *Chomiocarpon Chiffleti* Lamothe, proposed as a new species, is a synonym of *Preissia commutata*.—A. W. Evans.

3772. DOUIN, ROBERT. *Variété et formes nouvelles de Muscinées*. [A new variety and new forms of Muscineae.] *Bull. Soc. Bot. France* 72: 455-458. Fig. 1-11. 1925.—The variety and the 2 forms here proposed as new came from the vicinity of Lautaret (Hautes-Alpes), France, and are as follows: *Amblystegium fluviatile* var. *denticulatum*, *Hypnum Notarisii* f. *latifolia*, and *Philonotis fontana* f. *inundata*.—J. Beauverie (translated).

3773. FINCKH, H. E. *Riccia*. *Australian Nat.* 5: 239. 1925.—*Riccia fluitans* and *R. natans* are reported from Bulladelah, New South Wales.—T. C. Frye.

3774. G[EPF], A. [Rev. of: CRABTREE, J. H. *British mosses and how to identify them*. 62 p. 72 fig. ("How to identify" series 19.) The Epworth Press: London, 1924. (See

Bot. Absts. 15, Entry 775.]) Jour. Botany 62: 253. 1924.—The reviewer criticises the author's antiquated nomenclature and also his use of English names for mosses.—A. W. Evans.

3775. HAYNES, CAROLINE COVENTRY. Sullivant Moss Society exchange list of Hepaticae found in the United States, Canada, and Arctic America. Bryologist 28: 79-82. 1925.—The original list, which bore the same title, appeared in 1918 (see Bot. Absts. 2, Entry 984). In the present list 451 species are included, representing a net gain of 33 species.—A. W. Evans.

3776. HENNEN, J. A propos de *Desmatodon cernuus* Br. Eur. Bull. Soc. Roy. Bot. Belgique 56: 164-165. 1924.—Although *Desmatodon cernuus* is usually regarded as an essentially montane species, the author expresses the opinion that this is not really the case. He cites, in support of this view, a new Belgian station, at Merxem, where he discovered it in 1887.—A. W. Evans.

3777. HENRY, RENÉ. Additions à la flore bryologique vosgienne. [Additions to the moss flora of the Vosges.] Bull. Soc. Bot. France 70: 923-932. 1923.—The species enumerated include 36 mosses, 4 peat mosses, and 19 hepatics, full data regarding stations being given with each. Six of the mosses, 1 of the peat mosses and 4 of the hepatics are recorded from the district for the 1st time, and a number of critical notes are scattered through the paper.—P. A. Young.

3778. HERZOG, TH. Anatomie der Lebermoose. [Anatomy of the liverworts.] In: LINSBAUER, K. Handbuch der Pflanzenanatomie 7: 1-112. Fig. 1-93. 1925.—In the introduction the author emphasizes the fact that the anatomical differentiation of the liverworts has not kept pace with the differentiation in external form. He divides his subject-matter into 3 chapters. The 1st deals with the anatomy of the liverworts in general, the 2nd with the special anatomy of the gametophyte, and the 3rd with that of the sporophyte. Under anatomical elements he includes meristem, parenchyma, conducting or mechanical strands, and specialized cells. A short section on gemmae and another on sex organs and calyptras bring the chapter to a close. In the 2nd chapter the thallus is placed in contrast to the cornus, or leafy shoot. Two main types of thallus are recognized, the 1st with simple structure and the 2nd with stratified structure. Thalli with simple structure include the Aneurapellia-, Metzgeria-, and Symphyogyna-types, each of which is described in detail. Thalli with stratified structure are found in the Marchantiales and include the Marchantia- and Riccia-types. In the Marchantia-type the compact ventral tissue and the assimilatory layer, with its epidermal covering and pores are discussed at length, with illustrative examples. In the Riccia-type especial emphasis is laid on the assimilatory layer. In the cornus the slight differentiation into tissues exhibited by the stem and the great diversity in the form and lobing of the leaves is brought out. In the 3rd chapter the foot, stalk and capsule are taken up in order, the structural features of the capsule in the 3 orders of the Hepaticae receiving the most attention. In the Jungermanniales the following types of capsule are distinguished and illustrated: the Pallavicinius-, Aneurapellia-, Frullania-, and Jungermanniaceae-types. The multicellular elaters of the Anthocerotales are contrasted with the unicellular elaters of the Marchantiales and Jungermanniales, several types of the latter being distinguished. The various types of spore wall-sculpture are described.—A. W. Evans.

3779. HERZOG, TH. Beiträge zur Bryophytenflora Chiles. [Contributions to the bryophyte flora of Chile. Hedwigia 64: 1-18. Fig. 1-5. 1923.—This report is based on 2 collections of Chilean bryophytes: The 1st, by the author in the vicinities of Valdivia and Punta Arenas; the 2nd, by K. Wolfhügel near Lago Todos Santos, Province of Valdivia. The hepaticae listed number 21 and the mosses 84. The following hepatics are proposed as new: *Frullania crassa*, *F. decipiens*, *Lophocolea Stephanii*, *Plagiochila subquinquespina*, and *P. Valdiviae*. The mosses proposed as new are as follows: *Daltonia Valdiviae*, *Glyptothecium gracile* var. *nanum*, *Hypopterygium Wolfhügelii*, *Orthotrichum ulotoides*, *Rhynchostegium subsquarrosum*, *Thuidium inconspicuum*, and *Tortula bullata*. In addition the new name *Fissidens valdiviensis* is substituted for *F. Brotheri* Dusén, which is antedated by *F. Brotheri* Paris of Africa. The figures illustrate 5 of the new species.—A. W. Evans.

3780. HERZOG, TH. Contribuições ao conhecimento da Flora Bryologica do Brasil. [Con-

tributions to our knowledge of the moss flora of Brazil.] Arch. Bot. Estado de Sao Paulo 1: 27-105. 9 fig. 1925.—This report is largely based on collections by F. C. Hoehne in Sao Paulo and Minas Geraes, Brazil. It includes, however, a number of records based on other collections, a few of which were made in other Brazilian States or even in other South American countries. The species listed total 199, representing 93 genera. They are classified as follows: Marchantiales, 2 genera, 2 species; Jungermanniales, 20 genera, 60 species; Sphagnales, 1 genus, 5 species; and Bryales, 70 genera, 132 species. Full data regarding stations are given with each species, and many critical remarks are interspersed. The following hepatics are proposed as new: *Aneura fucoides* var. *dentilobula*, S. Paulo; *Madotheca Zikanii*, Minas Geraes; *Plagiochila corrugata* var. *subintegerrima*, S. Paulo; and *Trichocolea argentea*, S. Paulo. The proposed new species of mosses number 20 and are as follows, Herzog being the authority except where otherwise noted: *Bryum impresso-truncatum*, Minas Geraes; *Callicostella jungermannioides*, Piahy; *C. scaberrima* Broth., Bolivia; *Calymperes Othmeri*, British Guiana; *Dicranoloma brasiliense*, Rio de Janeiro; *Dimorphella brasiliensis* Broth. & Herzog, Minas Geraes; *Fissidens ornatus*, S. Paulo; *Helicoblepharum brasiliense*, Minas Geraes; *Holomitrium nitidum*, S. Paulo; *Leptodontium variegatum*, Brazil; *Macromitrium Hoehnei*, S. Paulo; *M. Zikanii*, Minas Geraes; *Octoblepharum Luetzelburgii*, Bahia; *Polytrichum reflexifolium*, S. Paulo; *Rhaphidostegium Hoehnei*, S. Paulo; *R. pectinatum*, Rio de Janeiro; *Syrrhopodon Luetzelburgii*, Bahia; *S. rivularis*, Espirito Santo; *Timmiella alata*, Brazil; and *Trichostomum lignicolum*, Minas Geraes. *Madotheca ligula* Steph., *Phylophylum tenuifolium* Mitt., and several of the new species are figured.—A. W. Evans.

3781. LOEZINGER, JOHN M. On *Grimmia Brandegei* Austin. Bryologist 28: 75. 1925.—The author discusses the status of *Grimmia Brandegei*, reducing it to synonymy under *G. conferta* Funck.—A. W. Evans.

3782. LOESKE, L. Problematisches über *Catharinaea undulata*. [Problems connected with *Catharinaea undulata*.] Verhandl. Naturhist. Ver. Preussisch Rheinlande und Westfalens 81: 193-202. 1924 [1925].—The author emphasizes the fact that much still remains to be learned about *Catharinaea undulata*, in spite of its abundance and wide distribution. He quotes divergent views according to which the species is monœcious, polyœcious or diœcious, and reaches the conclusion that female plants without antheridia certainly occur, although the inflorescence is normally monœcious. He thinks that too much stress is laid on the inflorescence as a specific character among the bryophytes and that a species based solely on a divergent type of inflorescence has no justification. He refers to Péterfi's work on *Catharinaea undulata* (1902) and gives an amended version of his key to the various forms of the species and its immediate allies.—A. W. Evans.

3783. LOESKE, L. Wie man Moose sucht und sammelt. [How mosses are to be sought for and collected.] Verhandl. Bot. Ver. Prov. Brandenburg 67: (1-7). 1925.—The author gives directions for bryological exploration and collection, emphasizing the fact that abundant species should not be neglected and insisting that almost any region is worthy of intensive and prolonged study. He describes various types of habitat, mentions the more important species of each, and recommends that the beginner confine his attention to fertile specimens, showing that sterile material in certain genera is often wholly indeterminable.—A. W. Evans.

3784. LOESKE, L. Zur Moosflora von Berlin. [The moss flora of Berlin.] Verhandl. Bot. Ver. Prov. Brandenburg 67: (1-7). 1925.—Referring to his earlier papers, the author notes that the moss flora of the Berlin region has perceptibly changed during recent decades and that certain species have become less abundant. At the same time the number of species now known has been increased through recent discoveries and through the introduction of new forms. Five mosses new to the region have been found in the limestone hills near Rüdersdorf. In the Botanical Garden at Dahlem the "Alpinum" has yielded several species of interest, including 2 novelties, and in the greenhouse the tropical *Splachnobryum Geheebii* has persisted. A list of 13 hepatics, 1 peat moss and 33 mosses, with full data regarding stations, makes up the greater part of the paper. In this list 3 hepatics and 4 mosses represent additions, and a number of critical remarks are included.—A. W. Evans.

3785. LOESKE, L. Zur Systematik einiger europäischer Laubmoose. [The taxonomy of

certain European mosses.] Allg. Bot. Zeitschr. 1925: 19, 20. 1925.—The author discusses *Cynodontium Limprichtianum* Grebe, *Dicranoweisia compacta* (Schleich.), *Fabronia Sendtneri* Schimp., and *Polytrichum commune* var. *nigrescens* Warnst. Following Hagen he concludes that the *Cynodontium* is a variety of *C. suecicum* (Arn. & Jens.) Hag., that the *Dicranoweisia* should again be called *D. crispula* var. *compacta* (Schleich.) Lindb., and that Warnstorf's variety should be transferred to *P. Swartzii* Hartm. Following Fleischer, he refers the *Fabronia* to the genus *Scorpiurium* as *S. Sendtneri* (Schimp.) Fleischer and shows further that *Scorpidium leskeoides* Th. Suse should be regarded as a synonym.—A. W. Evans.

3786. MORQUER, R. Sur l'extension du *Pottia commutata* Limp. en France et sur quelques autres Muscinées nouvelles pour la région toulousaine. [The extension of the range of *Pottia commutata* in France and on certain other bryophytes new to the region of Toulouse.] Bull. Soc. Bot. France 71: 559-565. 1924.—The author announces his discovery of *Pottia commutata* Limp. near Toulouse, France. He points out the distinctive features of the species, especially those subject to variation, and gives an account of its history and geographical distribution. He then reports *Acaulon triquetrum* (Spruce) C. Müll. and *Fissidens impar* Mitt. as further additions to the flora of the region.—A. W. Evans.

3787. NAVEAU, R. Notice sur le distribution de certains cryptogames. [Notes on the distribution of certain cryptogams.] Bull. Soc. Roy. Bot. Belgique 56: 185-190. 1924.—The present report deals with the heather associations of the Campine, a region situated largely in northeastern Belgium. By means of a list of 95 mosses, 20 hepatics, and 90 Basidiomycetes the author shows that the cryptogamic flora of the western part of this region differs in many respects from that of the eastern part.—A. W. Evans.

3788. NICHOLS, GEORGE E. The bryophytes of Michigan with particular reference to the Douglas Lake region. Bryologist 25: 41-58. 1922.—The region studied by the author embraces Douglas and Burt Lakes in Cheboygan County, a few localities in Emmet County, and Mackinac Island in Mackinac County. After a review of the literature dealing with the bryophytes of Michigan he describes the principal types of habitat of bryological importance. These include the hardwood forests, the aspen woodlands, the lake bluffs, the sandy lake shores, the rocks and cliffs on Mackinac Island, the gorge near Douglas Lake, the streams, the coniferous forest swamps, the open marshy swamps, and the open Sphagnum bogs. The list of species, with habitats and stations, which constitutes the bulk of the paper, includes 59 hepatics and 202 mosses, a total of 261 species, 101 of which are reported for the 1st time from Michigan. A summary at the close indicates a total of 321 species for the entire state, distributed as follows: Marchantiaceae, 4; Ricciaceae, 2; Metzgeriaceae, 9; Jungermaniaceae, 56; Sphagnaceae, 17; and Bryaceae, 232.—A. W. Evans.

3789. NICHOLS, GEORGE E. The bryophytes of Michigan, with particular reference to the Douglas Lake region.—II. Bryologist 28: 73-75. 1925.—In the present paper the author continues his observations on the bryophytes of Michigan (see preceding entry). The species listed include 21 additions to the Douglas Lake list, 8 of which are hepatics. These raise the total number of species for the region to 282 and the total number for the state to 337.—A. W. Evans.

3790. NICOLAS, G. Remarques biologiques sur le *Fegatella conica* (L.) Corda. [Biological notes on *Fegatella conica*.] Bull. Soc. Bot. France 72: 29-33. 1925.—According to Bolleter, *Fegatella conica* can multiply vegetatively by means of small tubercles developing on the ventral surface of the thallus. The view has recently been expressed that there is some relation between these tubercles and the presence of an endophytic mycelium in the thallus, but the author shows that this is not the case. He shares, however, the opinion of Bolleter that the formation of sexual organs is associated with the presence of the mycelium, and that a true symbiosis exists between the liverwort and the fungus. This idea is supported by the fact that he has observed many sterile thalli without hyphae, while thalli with male or female inflorescences invariably contain them. The mycelium noted is branched and of the siphonous type, as already described by Bolleter.—R. Douin (translated).

3791. POTIER DE LA VARDE, R. Compte rendu de l'herborization publique du 15 avril 1923, a Harcourt. [Report on the public botanical excursion of April 15, 1923, at Harcourt.] Bull.

Soc. Linn. Normandie VII, 6: 46-53. 1923 [1924].—The author lists the various mosses and hepatics observed and collected during a public botanical trip to Harcourt, Département of Calvados, France, the species being arranged according to their respective habitats. Especial attention is called to *Fissidens algarvicus* Solms-Laub. and *Lophozia barbata* Dum., 2 species new to Calvados.—*M. Denis* (translated).

3792. POTIER DE LA VARDE, R. *Mousses nouvelles de l'Afrique tropicale française* (Diagnoses préliminaires). [New mosses of French tropical Africa.] Bull. Soc. Bot. France 72: 351-367. Fig. 1-18. 1925.—The author has received interesting collections of African bryophytes from Upper Ubangi, Gabon and the vicinity of Bambari. Those from the last region were collected by R. P. C. Tisserant, those from the first 2 regions, by Le Testu. More than 150 species have already been determined, many of which are remarkable from the standpoint of distribution. In the present paper preliminary diagnoses of 23 new species and varieties are given, as follows: *Acanthocladium albescens* Thér. & P. de la V., Upper Ubangi and Gabon; *Acrocryphaea latifolia* Broth. & P. de la V., Upper Ubangi; *A. subrobusta* Broth. & P. de la V., Upper Ubangi; *A. Tisserantii* Thér. & P. de la V., Moronbas; *Bryum subalbulum* Thér., summit of Ouanda-Djale, already known from Cameroons; *Callicostella acuminatula* Broth. & P. de la V., Gabon; *C. gabonensis* Broth. & P. de la V., Gabon; *C. papillosula* Broth. & P. de la V., Ngounye; *C. perpapillata* Broth. & P. de la V., Gabon; *C. submarginatula* Broth. & P. de la V., Upper Ubangi; *Calymperes Chevalieri* var. *angustifolium* Thér. & P. de la V., Gabon; *C. conterminum* Thér. & P. de la V., Gabon; *Erythrodonium chalcophyllum* Thér. & P. de la V., Dangara; *Fissidens propinquus* P. de la V., Gabon; *Leptodontium insolitum* Thér. & P. de la V., Upper Ubangi; *Leucobryum Letestui* P. de la V., Gabon; *Leucomium Letestui* Broth. & P. de la V., Upper Ubangi; *Microdus subnitidulus* Thér. & P. de la V., Ngounye; *Pinnatella Letestui* Thér. & P. de la V., Gabon; *Pogonatum congolense* var. *subintegriifolium* Thér. & P. de la V., Gabon; *Taxithelium Theriotii* P. de la V., Gabon; *Thyridium Letestui* Thér. & P. de la V., Gabon; and *Trichosteleum gabonense* Broth. & P. de la V., Gabon.—*L. Faucheron* (translated).

3793. POTTIER, JACQUES. A propos des mousses récoltées en Maurienne pendant la session de 1920. [Mosses collected in Maurienne during the 1920 session.] Bull. Soc. Bot. France 71: 263. 1924.—The author refers to his earlier list of the mosses collected during the 1920 session of the Botanical Society of France in the Département of Savoie, corrects an error, and amplifies his remarks on certain species of *Mnium*.—*A. W. Evans*.

3794. SAVICZ, V. P. [Rev. of: BROTHERUS, V. F. [Бротерусъ, В. Ф.] Мхи (Bryales). Часть II. [Mosses (Bryales). Pt. 2. In: ФЕДЧЕНКО, В. А. [Федченко, В. А.] Флора Азиатской России Выпускъ. (Flora of Asiatic Russia.) Fasc. 13. P. 81-182. Fig. 12-27. Petrograd, 1918.] Bryologist 28: 39-41. 1925.—The reviewer calls attention to the general scope of Brotherus' work on the mosses of Asiatic Russia and states that it was largely based "on the vast material collected in a series of expeditions . . . organized by the Ministry of Agriculture during the years 1909-1914 for purposes of colonization in Siberia." In the 1st part of the work *Andreaea amurensis* Broth. and *Rhabdoweisia Kusenevae* were proposed as new. The reviewer emphasizes the usefulness of the work for students of Asiatic mosses. (See also this issue, Entry 3761).—*A. W. Evans*.

3795. SIM, T. R. The mosses of the south-west portion of South Africa. South African Jour. Sci. 21: 293-307. 1924.—The south-west corner of Africa is one of the most interesting botanical areas in the world, but the mosses of this region have not been so closely studied as the phanerogams. The author lists 146 mosses from various localities, grouping them from an ecological standpoint. Full habitat details are given, and a number of new species are mentioned. These have been named in manuscript by Dixon but have not yet been described.—*E. M. Doidge*.

3796. SIMPSON, J. R. Some moss records for Selkirk. Trans. & Proc. Bot. Soc. Edinburgh 29: 72-82. 1924.—This is a detailed list of 126 mosses found in the Selkirk region of Scotland, a district rich in mosses. The stations are carefully described, and 39 of the species listed represent additions to the flora of the County. Especial attention is called to the mosses appearing after the drainage of Bowhill Loch.—*Thomas Swarbrick*.

3797. VAN DEN BROECK, H. Note sur la découverte du *Barbula inermis* C. Muell., mousse

nouvelle pour la flore belge. [Note on the discovery of *Barbula inermis*, a moss new to the Belgian flora.] Bull. Soc. Roy. Bot. Belgique 57: 112. 1924.—The author gives a brief description of *Barbula inermis* and announces its discovery at Reinhardstein, Malmédy.—A. W. Evans.

3798. WHELDON, J. A. Additions to the Scottish Sphagna. Jour. Botany 62: 321-327. 1924.—In the Synopsis of European Sphagna, published by the author in 1917, 30 species of Sphagnum would have been recorded from Scotland, if the species had been defined according to present standards. He now recognizes 40 species as Scottish, most of which are represented by several varieties and forms. His list includes the names of collectors and the numbers of the British vice-counties, no more definite stations being indicated as a rule. *S. tenerum* Sull. is reported as new to Britain, and *S. plumulosum* var. *flavofuscescens* f. *gracile* is proposed as new.—A. W. Evans.

3799. WHELDON, J. A. *Sphagnum riparium* Angstr. in Cheshire. Jour. Botany 62: 276-277. 1924.—The discovery of the rare *Sphagnum riparium* at New Ferry, in Wirral, Cheshire, England, by members of the Liverpool Botanical Society, is announced. The specimens collected represent var. *coryphaeum* Russ. f. *gracilescens* Russ., which is apparently new to the British Isles.—A. W. Evans.

3800. WILLIAMS, R. S. *Orthotrichum Bartrami* sp. nov. Bryologist 28: 76. Pl. 19. 1925.—Under the name *Orthotrichum Bartrami* the author describes and figures a new species related to *O. tenellum* Bruch. His material was collected in 1922 by E. B. Bartram in the Whitehouse Canyon, Santa Rita Mountains, Arizona.—A. W. Evans.

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*
J. E. FLYNN, *Assistant Editor*

(See also in this issue Entries 3241, 3264, 3289, 3353, 3424, 3591, 3737, 3790, 3874, 3876, 3880, 3882, 3889, 3894, 3895, 3910, 3911, 3916, 4122, 4162, 4178, 4184, 4226)

[FUNGI

3801. ANONYMOUS. La forma ascofora della *Rhacodiella castanea*. [The ascopore form of *Rhacodiella castanea*.] Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. Roma. 2: 35. 1921.—This species produces a black rot of the chestnut. It is probably the conidial form of *Sclerotinia pseudotuberosa* Rehm, but the method of infection has not been determined. R. Ciferri (translated).

3802. ANONYMOUS. La forma ascofora dell'Oidio quercia a Roma. [The ascus form of the oak Oidium at Rome.] Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. Roma. 2: 35-36. 1921.—The perithecia of the Oidium of oak found at Rome have been regarded as belonging to *Microsphaera quercina* (Schw.) Burrill, but the conidial form found throughout Italy, Switzerland and Portugal seems to belong to the related species *M. alni*. Notes on habitat as affecting perithecial production are given.—R. Ciferri (translated).

3803. ANONYMOUS. Un ifomicete a conidi mesoendogeni. [A hyphomycete with mesoendogenous conidia.] Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. Roma. 2: 94. 1921.—In this preliminary note a new species, *Menispora microspora* Peyr., is described from the bark of chestnut. The conidia are pushed out successively from an opening at the funnel-shaped apex of a flask-shaped conidiophore. They are freed as incompletely formed spores and their method of formation is termed mesoendogenous.—R. Ciferri (translated).

3804. ARTHUR, J. C. The grass rusts of South America, based on the Holway collections. Proc. Amer. Phil. Soc. 64: 131-223. Fig. 1-10. 1925.—The writer precedes the list of grass rusts of South America by a detailed itinerary of the 2 collecting trips of Professor and Mrs. E. W. D. Holway of Sept. 4, 1919 to Oct. 6, 1920 in Chile, Bolivia, Peru and Ecuador, and of Aug. 8, 1921 to Aug. 31, 1922 in Brazil, Uruguay and Argentina. A bibliography of 63 titles

dealing with South American grass rusts, a key to the 74 species in the list and an index both to the rusts and to their hosts is included in the paper. There are 57 species of *Puccinia*, 12 of *Uromyces*, and 5 of *Uredo* in the list. The following are described as new species: *Puccinia compressa*, *P. cryptica*, *P. variospora*, *P. tornata*, *P. opuntiae*, *P. melicina*, *P. decolorata*, *P. nasellae*, *P. digna*, *Uromyces paspalicola*, *U. bromicola*, *U. pencaus*, and *Uredo rubida*.—Wanda Weniger Brentzel.

3305. ARTHUR, J. C. (*Uredinales*) Additions and corrections (continued). North Amer. Flora 7¹⁰: 669-732. 1925.—The series of additions and alterations begun in the preceding part are here continued. The remainder of the Uredinaceae and a portion of the Aecidiaceae are covered.—H. M. Fitzpatrick.

3306. BARON, L., J. MAGROU, ET J. VALTIS. Onychomycose à *Pityrosporum ovale*. [An onychomycosis due to *P. ovale*.] Compt. Rend. Soc. Biol. 92: 557-558. 1925.—This fungus common on the scalp is reported for the first time in lesions of the nails. It was doubtless transferred to the nails as a result of scratching the scalp.—Oran Raber.

3307. BERNARD, CH., AND A. STEINMANN. Luizenschimmels. [Scale fungi.] Thee 6: 42-45. *Illus.* 1925.—*Hypocrella Reineckiana* is reported for the first time in the Dutch East Indies on species of *Lecanium* on *Albizia*. A review of literature on tropical insect fungi is given.—Carl Hartley.

3308. BOUWENS, HENRIETTE Untersuchungen über Erysipheen. [Researches on Erysiphaceae.] Mededeel. Phytopath. Lab. Willie Com. Scholten [Baarn] 8. 1-47. 1920.—It is often impossible to identify powdery mildews because their perithecia are frequently wanting. Since the conidia are usually exceedingly abundant the author investigated the question as to whether they may be of use in identification. Living material is necessary for accurate observation of such characters as the size and shape of the ripe conidium. Measurements show that the length and width, especially the width, are characteristic. Application of the biometric method provides a key to the genera and species of the group and a hint is given that further investigation will show the species to be split up into a number of biologic forms.—Johanna Westerdijk.

3309. BRESADOLA, ABBE. Diagnoses novarum specierum Polyporacearum ex India occidentali et orientali. Mededeel. Rijks Herb. 4: 73-74. 1923.—The writer gives descriptions of the following new species: *Polyporus Goethartii*, *Fomes latissimus*, *F. subendothejus*, *F. surinamensis*. Notes on a few previously known species are also given.—M. F. L. Fitzpatrick.

3310. BRIGHT, T. B. Methods of examination of mildewed cotton material. Jour. Roy. Microsc. Soc. London 1925: 141-144. 2 pl. 1925.—Samples of cotton are stained in picronigrosin or cotton blue, mounted in thick Canada balsam, and examined by means of a compound binocular microscope, using a $\frac{3}{8}$ -inch objective, and a "Pointolite" lamp. In this way, the cotton fibers are rendered invisible, and the fungus mycelia stand out clearly.—Ralph E. Cleland.

3311. BURKHOLDER, WALTER H. Variations in a member of the genus *Fusarium* growing in culture for a period of five years. Amer. Jour. Bot. 12: 245-253. 1925.—When *Fusarium martii phaseoli* Burkholder was grown in culture for 6 years it underwent marked changes, both morphological (microscopic as well as macroscopic) and physiological. When beans were then inoculated with this fungus and it was subsequently isolated again on artificial media, most of the original characters were found to have returned. The virulence of the 6-year-old pathogene had been lowered, and this was usually not found to have increased after infection and reisolation. It is suggested that these changes may sometimes become permanent, thus explaining the multiplicity of closely related forms in *Fusarium*.—E. W. Sinnott.

3312. CHAPMAN, A. CHASTON. The Yeasts: a chapter in microscopical science. [President's address, Royal Microscopical Society, London.] Jour. Roy. Microsc. Soc. London 1925: 1-16. 1925.—Early attempts to explain the nature of fermentation are recounted, and a description is given of some of the microscopes which were used, particularly those of Leeuwenhoek, who first discovered the yeast organism. A history of subsequent researches is offered. Methods of reproduction, the question of classification, and the present

state of cytological knowledge of the yeasts are discussed, and emphasis is laid upon the importance of yeast as an object upon which to base further investigation into the physiological and chemical activities of protoplasm.—*Ralph E. Cleland.*

3813. CIFERRI, R. Ancora sul marciume delle mele cotogne. [Again on the rot of the quince.] Rivist. Patol. Veg. 14: 77-92. 1924.—Taking up again study of a fungus causing a rot of the quince (*Cydonia vulgaris*) fruit, previously attributed (Ciferri. Rivist. Patol. Veg. 12: 12-17. 1922) to the species *Penicillium crustaceum* (L.) Fries, the writer made a morphological and detailed cultural study of the fungus following largely the system of Biourge (see Bot. Absts. 13, Entry 3608). The fungus is described as a new species under the name *Penicillium malivorum*.—*F. M. Blodgett.*

3814. CIFERRI, R. Studi sulle Torulopsidaceae—Sui nomi generici di *Torula*, *Eutorula*, *Torulopsis*, *Cryptococcus*, e sul nome di gruppo *Torulaceae*. [Studies on the *Torulopsidaceae*. On the generic names *Torula*, *Eutorula*, *Torulopsis*, *Cryptococcus*, and on the name of the group *Torulaceae*.] Atti Ist. Bot. Univ. Pavia 3 ser. 2: 129-142. 1925.—This is a critical study in the literature of the terms used in the above title, their past and present significance being considered. In order to avoid the confusion existing today between the application of *Torula* Persoon for a genus of the Hyphales-Dematiaceae and of *Torula* Turpin emend. Will for one of the genera of non-ascigerous yeasts, it is proposed to reserve the name for the genus of Persoon which is the older, and to use the family name *Torulaceae* only in that connection. For the genus of Turpin the name *Torulopsis* Berlese is used and this genus and its relatives will be considered in the *Torulopsidaceae* nom. nov. The name *Eutorula* Will is antedated by *Eutorula* Saccardo, and *Eutorulopsis* nom. nov. is proposed for the former. The name *Cryptococcus* Kützing-Vuillemin is rejected because the author regards parasitism as an insufficient basis for generic separation.—In the *Torulopsidaceae* in addition to the genera *Torulopsis* and *Eutorulopsis* the forms with true or false mycelium will be included in *Mycotorula* Will and in part in the genera of DeBeurmann & Gougerot, but extreme forms such as *Candida* Berkhout will be excluded.—A diagnosis of *Eutorulopsis* and an amended diagnosis of *Torulopsis* Berlese are given.—*Author (translated).*

3815. CIFERRI, R. Su due malattie di piante da serra. [Two diseases of wall plants.] Rivist. Patol. Veg. 14: 50-58. 1924.—A new host, *Bignonia argyrea* André was found for the fungus *Sphaerella Capreolatae* (Passerini) Saccardo. *S. Passiflorae* var. *Bignoniae* Rehm. is regarded as synonymous with this. The same *Bignonia* is also a new host for *Cladosporium herbarum* (Persoon) Link. An anthracnose was also found on *Magnolia Hartwegii* Hort. (= *M. grandiflora* L.). The causal fungus is described as a new species under the name *Colletotrichum Ticinense*. Acervulae without setae were found in the same spots which corresponded to *Gloeosporium Haynaldianum* Saccardo & Roumeguère with which he considers *G. Magnoliae* Passerini synonymous.—*F. M. Blodgett.*

3816. CIFERRI, R. Una ruggine della *Centaurea macrocephala* Puschk. [A rust of *Centaurea macrocephala* Puschk.] Rivist. Patol. Veg. 14: 41-49. 1924.—A rust found on *Centaurea macrocephala* is described as a new species ad interim under the name *Puccinia picena*. A list of the rusts reported on this host and a bibliography are included.—*F. M. Blodgett.*

3817. COOL, C. Contribution à la flore mycologique des îles Canaries. [Contribution to the mycological flora of the Canary Islands.] Mededeel. Rijks Herb. 51: 1-4. 1925.—In this article the author publishes a classified list of all the known species thus far collected in the Canary Islands by herself, Despreaux, and Montagne.—*M. F. L. Fitzpatrick.*

3818. EDDY, E. D. A storage rot of peaches caused by a new species of *Choanephora*. Phytopathology 15: 607-610. Fig. 1. 1925.—A brief review is given on the Mucorales as the cause of decay in vegetables and fruits in transit, storage, and on the market. A new species of *Choanephora* closely related to *C. cucuritarum* (B. & Br.) Thaxter and named by the author *C. persicaria*, was isolated from peaches found on the New York market. The organism grows indefinitely in culture, producing a heavy black mat of sporangia. That it was a facultative parasite capable of causing decay of peaches was proved by inoculation tests with healthy peaches. At no time has there been a conidial stage produced either on the fruit or in culture. An English description is included.—*Naomi Chapman.*

3819. FEHER, DANIEL. Ueber das Vorkommen der Perithezien des Eichenmehltaupilzes

auf dem Gebiete des heutigen Ungarn. [Occurrence of the perithecia of oak mildew in Hungary.] Centralbl. Gesam. Forstw. 49: 294-296. 1923.—The perithecia of *Microsphaera alni* f. *quercina*, introduced into Europe from America, were first found in France in 1911, in Italy in 1919 and 1922, and in Germany in 1920. They were found in Hungary in 1922 and 1923, on *Quercus cerris*, *Q. pubescens*, and *Q. pedunculata*.—W. N. Sparhawk.

3820. FRIES, THORE C. E. Die Gasteromyceten der Juan Fernandez- und Osterinseln. [The Gasteromycetes of Juan Fernandez and Easter Island.] In: SKOTTSBERG, C. The natural history of Juan Fernandez and Easter Island. Vol. 2. P. 59-60. 1922.—One species of *Lycoperdon* and *Geaster ohioensis* Lloyd, known before from North America and Samoa, are recorded from Juan Fernandez; *Bovistella pusilla* Lloyd, known before from Australia, from Easter Island.—C. Skottsberg.

3821. GREEN, ETHEL. Note on the occurrence of clamp connexions in *Hirneola auriculajudae*. Ann. Botany 39: 214-215. 3 fig. 1925.—Numerous clamp connections were found, especially towards the sterile surface and less frequently towards the hymeneal layer.—W. P. Thompson.

3822. HÄYRÉN, ERNST. *Mucor plumbeus* Bonorden. (*M. spinosus* van Tieghem) aus Finland. Meddel. Soc. Fauna et Flora Fennica 48: 177-179. 1 fig. 1924.—The fungus was found in southern Finland. The protuberances on the columella are adequately described and figured.—Author (translated).

3823. HRANOVA, ANA. Levure développée sur l'amygdale. [A yeast on the tonsil.] Compt. Rend. Soc. Biol. 92: 670-672. 1 fig. 1925.—From the left tonsil a new species of yeast is described under the name of *Torula pettiti*. Morphological and cultural characters are given.—Oran Raber.

3824. HUMPHREY, HARRY B., AND VICTOR F. TAPKE. The loose smut of rye (*Ustilago tritici*). Phytopathology 15: 598-606. Fig. 1-3. 1925.—Comparative cultural and microscopic studies of loose smut of rye and wheat failed to reveal any differences between them. The reaction of the rye plant to invasion by *Ustilago tritici* (Pers.) Jens. differs from that of wheat in that as a rule only the lower $\frac{1}{3}$ or $\frac{1}{2}$ of the rye head is destroyed, while in wheat complete destruction of the florets is the rule. Cross-inoculation experiments in which heads of both wheat and rye were inoculated with spores from wheat and from rye, respectively, aided in showing the identity of the 2 smuts to be the same. Varietal resistance observations indicated that of 13 varieties and selections only 2, Rosen (C. I. 195) and Rimpau (C. I. 126) were susceptible.—Naomi Chapman.

3825. KASAI, M. *Fusarium Aspidioti* Sawada, its culture and morphology. Ber. Ohara Inst. Landw. Forsch. 2: 547-558. 1 pl. 1925.—The fungus is said to be parasitic on the San José scale insect (*Aspidiotus perniciosus* Comst.) found on branches of the pear tree in Shizuoka Prefecture only. On carbohydrate media the typical *Fusarium* pigments were formed. Microconidia were not found but macroconidia developed readily. The spores are described in detail. The author concludes that the fungus is distinct from *F. epicoccum* McAlpine.—H. S. Reed.

3826. LAGARDE, J. Discomycetes de France. I. Les Morilles. P. 1-35. Pl. 1-5. 1923.—II. Les Helvelles. P. 39-82. Pl. 6-12. La Pensée Française: Paris, 1924.

3827. LUYK, A. VAN. Mykologische Bemerkungen. [Mycological observations.] Mededeel. Rijks Herb. 39: 1-10. 10 fig. 1919.—A study of the Geoglossaceae of the Royal Herbarium at Leyden. The 15 species listed are fully annotated and the figures given outline the asci, spores, and paraphyses.—T. J. Fitzpatrick.

3828. MILLER, JULIAN H. Preliminary studies on *Pleosphaerulina briosiana*. Amer. Jour. Bot. 12: 224-237. 1 pl. 7 fig. 1925.—This species occurs in leaf spots of alfalfa. The material here described is similar to the original form from Italy except that the spores are brown instead of hyaline. The author describes the fungus and the germination, viability and ejection of the ascospores. When grown in artificial media the fungus failed to produce perithecia. Evidence from experiment indicates that this species is not parasitic on alfalfa but is saprophytic, following an entry made by an insect or by alfalfa white spot. It spreads to young plants, after a cutting, by the forceful ejection of ascospores from perithecia on leaves lying on the ground. How the spores are carried to greater distances is not known.—E. W. Sinnott.

3829. NANNIZZI, ARTURO. Lo stato ascoforo dell' *Oidium orbiculare* Nannizzi. (*Erysiphe Polygoni* DC. forma *Robiniae hispidae* Nannizzi). [The ascus stage of *Oidium orbiculare* Nannizzi.] Rivist. Patol. Veg. 14: 172-174. 1924.—In a previous note (Nannizzi,—Rivist. Patol. Veg. 13: 7-8, 1923) the conidial stage of a powdery mildew on *Robinia hispida* L. was described. Later examinations of the foliage of this plant in the Royal Botanical Garden of Siena revealed the presence of numerous perithecia which correspond in morphological characters with the collective species *Erysiphe Polygoni* DC. Since the conidial stage of *E. Polygoni* is clearly distinct from *Oidium erysiphoides*, this fungus is described as a new form or biologic race under the name *Erysiphe Polygoni* DC. f. *Robiniae hispida* Nannizzi.—F. M. Blodgett.

3830. NANNIZZI, ARTURO. Una specie critica di "*Oidium*" sulla *Robinia hispida* L. [A critical species of oidium on *Robina hispida* L.] Rivist. Patol. Veg. 13: 121-127. 1923.—On the same host and in the same locality a fungus was collected on *Robinia hispida* L. as had previously been described by Tassi, receiving the name *Oidium monosporum* and later included in the genus *Ovulariopsis* by P. A. Saccardo and D. Saccardo. Careful examination of fresh material showed that the spores are borne in chains rather than solitary so that the species is returned to the genus *Oidium* and redescribed under the name *O. orbiculare* Nannizzi.—F. M. Blodgett.

3831. NISIKADO, Y., UND MIYAKE C. Ueber ein neues *Helminthosporium* auf *Panicum Crus-Galli*. [A new *Helminthosporium* on *Panicum Crus-Galli*.] Ber. Ohara Inst. Landw. Forsch. 2: 597-612. 1 pl. 1925.—The fungus was discovered by the authors in 1919 and studied by them. Their manuscript was destroyed in the Tokio fire following the earthquake in 1923. Subsequently, Drechsler described *H. monoceras* on *Echinochloa Crus-Galli*, which is apparently the same species.—H. S. Reed.

3832. PARISI, R. Di un *Cystopus* dell'*Onobrychis Crista-galli* Lam. di Cirenica. [A *Cystopus* of *Onobrychis Crista-galli* Lam. of Cirenica.] Rivist. Patol. Veg. 14: 165-171. Fig. 1-3. 1924.—Specimens of *Onobrychis Christa-galli* Lam. were sent in by Cavara from Cirenica affected with a fungus parasite. This approximated in its characters *Cystopus candidus*, though differing slightly in the form and dimensions of its spores and conidiophores and in the nature and color of their membranes so that it is described as *Cystopus candidus* (Pers.) Lév. var. *Mauginii* mihi. No oospores were found.—F. M. Blodgett.

3833. PECK, A. E. Mycologists at Hackness. Naturalist 1925: 332-334. 1925.—The records contain 3 additions to the county flora.—W. H. Burrell.

3834. PETCH, T. *Entomophthora muscivora* Schroet. Naturalist 1925: 368. 1925.—*Entomophthora muscivora* was found at Aldbrough, E. Yorks., in October 1925, on a fly attached to a dead stoat; it appears to be an addition to the British fungus flora.—W. H. Burrell.

3835. PETRI, L. Osservazioni ed esperienze sull'*Oidia* delle Quercie.—I. Formazione di organi riferibili a clamidospore. II. Azione dei raggi ultravioletti sopra i conidi. [Observations and experiments on the *Oidium* of *Quercus*. 1. Formation of bodies regarded as chlamydospores. 2. Action of ultra-violet rays on the conidia.] Ann. R. Ist. Superiore Forest. Nazion. Firenze. 9: 1-26. 1924.—Bodies formed in the autumn and which seem to be organs of hibernation are regarded as chlamydospores. The relative resistance of the conidia to ultra-violet rays as compared with that of other spores is discussed.—R. Ciferri (translated).

3836. PRETI, GIACOMO. Intorno ad una malattia del *Chrysanthemum frutescens* Tumb. [A disease of *Chrysanthemum frutescens*.] Rivist. Patol. Veg. 14: 6-12. 1924.—*Chrysanthemum frutescens* plants cultivated in the botanical garden of Portici were attacked by a disease, the leaves turning yellow and finally brown and presenting a scurfy appearance. A hyphomycetous fungus, identified as a *Cladosporium* was first found. Later (October) a perithecial stage of a fungus was found similar in morphological characters to *Pleospora herbarum*. Also a pycnidial form was found ascribable to *Phoma herbarum* West and also conidia of an *Alternaria* were found. In pure cultures made from these different spore types the author obtained from ascospores of *Pleospora*, conidia of *Macrosporium* and new perithecia; from stylospores of pycnidia, new pycnidia; from conidia of *Cladosporium*, *Alternaria* fructifications. The systematic placing of the fungus causing this cladosporiose disease is reserved for further study.—F. M. Blodgett.

3837. WELLES, COLIN G. Taxonomic studies on the genus *Cercospora* in the Philippine Islands. Amer. Jour. Bot. 12: 195-218. 10 pl. 1925.—The size of conidiophores and conidia is not characteristic of the various species of this genus, for the same organism was found to be markedly influenced by the particular host plant on which it was growing and by other environmental agencies such as seasonal differences, light and moisture. Many common species, formerly classified as unrelated, are identical in their morphological and physiological features. Likewise, forms classified as identical from their similarity in host reaction and spore measurements, may actually be different. No constant morphological differences of taxonomic value were found, but organisms fundamentally different may be separated by their scope of parasitism and their behavior on artificial media.—E. W. Sinnott.

LICHENS

3838. BURNETT, P. E. B. Coral lichen. Australian Nat. 5: 239. 1925.—*Cladonia retepora* was found near Berrima, New South Wales.—T. C. Frye.

3839. CENGIA-SAMBO, MARIA. Ancora del preteso amido nei Licheni. [The purported starch in lichens.] Bull. Soc. Bot. Italiana 1921¹: 18-21. 1925.—A resume of the controversy on the point.—From author's abstract.

3840. CENGIA-SAMBO, MARIA. Licheni di Rodi raccolti dal Prof. Andriano Fiori nel 1° Agosto 1923. [Lichens of Rhodes collected by Prof. A. Fiori in August 1923.] Bull. Soc. Bot. Italiana 1924⁶: 123-125. 1924.—Only one lichen had been previously reported from Rhodes. Now 8 species and a variety are listed. The variety is described as new to science: *Ramalina calycaris* var. *sorediosa* n. var.—Author (translated).

3841. JONES, D. A. Lichen Flora of the Ingleton District. Naturalist 1925: 241-244. 1925.

3842. MAGNUSSON, A. H. A monograph of the Scandinavian species of the genus *Acarospora*. Kungl. Vetenskaps Vitterhets-Samhälles Handlingar [Göteborg] Fjärde Följden, 28: 1-150. 2 pl., 3 fig. 1924.—Beginning with a detailed study of the morphology in *Acarospora*, the author proceeds to describe the 35 species found in Scandinavia, with complete reference to synonymy and distribution. New species, varieties and combinations given are: *A. chlorophana* Mass. f. *dissoluta*, *A. molybdina* Mass. var. *confusa*, *A. brunneola*, *A. hysgina* (*Parmelia? hysgina* Wnbg, *Lecanora hysgina* Ach.), *A. macrospora* Th. Fr. f. *typica* and f. *incusa* (*A. castanea* b. *incusa* Kbr), *A. scabrida*, *A. verruciformis*, *A. smaragdula* Hav. f. *halophila*, *A. nitrophila*, *A. lapponica* Th. Fr. f. *minuta*, *A. glaucospora* Körb. f. *typica*, f. *nuda*, f. *sarcogynoides* and f. *melaniza*, *A. Hullingii*, *A. pelioscypha* Arn. f. *compacta* and f. *deminuta*, *A. fuscata* Arn. f. *macra* (*Lecanora fuscata* f. *macra* Harm.), f. *flavescens*, f. *elegantella*, f. *effigurata* (*Lecanora cervina* ♂ *effigurata* Sommerf.), *A. hospitans*, *A. insoluta* + var. *pycnidophora*, *A. badiofusca* Th. Fr. f. *typica* and f. *glaucocarpoides*, *A. Normannii*, *A. rosulata* (*A. fuscata* subsp. *discreta* f. *rosulata* Th. Fr.), *A. Durietzii*, *A. aequatula*, and *A. anomala*.—C. Skottsberg.

3843. MERESCHKOVSKY, C. DE. Matériaux pour une Monographie du Genre *Graphis*. [Materials for a monograph of the genus *Graphis*.] Candollea 1: 473-489. 1923.—The author gives descriptions of several new varieties and forms of *Graphis scripta* L. He also gives notes upon a key to the subdivisions of *Graphis scripta* as elaborated by Arnold.—A. S. Hitchcock.

3844. MERESCHKOVSKY, C. DE. Notes critiques sur quelques espèces de lichens de la Crimée mentionnées par plusieurs auteurs. [Critical notes on some species of lichens from Crimea mentioned by several authors.] Candollea 1: 491-499. 1923.—The notes concern *Lecanora esculenta*, *L. Schaereri*, *L. badia*, *Squamaria lentigera*, *S. Lagascae*, *Ramalina fraxinea* f. *ampliata*, *Parmelia saxatilis*, *Placodium cirrochroum* f. *obliterans*, *Lecidea cinereotra*, *Cladonia endiviaefolia*, *Physcia stellaris* var. *adscendens*, *Rhizopogon geographicum*, *Acarospora smaragdula*, *Collema palmatum*, *Verrucaria epidermidis*, and *V. verrucosa*.—A. S. Hitchcock.

3845. ZAHLBRUCKER, A. Catalogue lichenum universale. Bd. 3. Bogen 21-40. Gebrüder Borntraeger: Berlin, 1925.—[See also Bot. Absts. 11, Entry 2753.]

3846. ZAHLBRUCKNER, A. Die Flechten der Juan Fernandez-Inseln. [The lichens of

Juan Fernandez.] In: SKOTTSBERG, C. *The natural history of Juan Fernandez and Easter Island*. Vol. 2. P. 315-408. Pl. 24-25. 1924.—The number of species amounts to 186, of which 117 are recorded for the first time. The following new forms and combinations are all attributable to Zahlbruckner: *Microglæna fernandeziana*, *Arthopyrenia adnexa* Müll. Arg. var. *leptosperma*, *Porina fernandeziana*, *P. rufocarpella*, *P. depressula*, *Arthonia cytisi* Mass. var. *meridionalis*, *A. subnebulosa*, *A. berberina*, *Schismatomma accedens*, *Ocellularia subdenticulata*, *Gyalecta jenensis* (*Lichen jenensis* Batsch, *Gyalecta cupularis* Schaer.), *Coenogonium velutinum*, *Lemmopsis polychidioides*, *Parmeliella*, *synptychia* (*Pannaria synptychia* Tuck.), *Pannaria hilaris*, *P. rubiginosa* Del. var. *vulcanica*, *Psoroma vulcanisum*, *P. cephalodinum*, *P. dasycladum*, *P. angustisectum*, *Coccocarpia Gayana* (Mont.) Nyl. var. *subdivisa*, *Sticta fragillima* Bab. var. *linearis* (*Stictina fragillima* var. *linearis* Müll. Arg.), *S. Guillemini* Mont. var. *stictica*, *S. carpoloma* Del. f. *ornata*, *S. orygmæa* Ach. var. *endochrysea* (*S. endochrysea* Del.), var. *Durvillei* (*S. Durvillei* Del.), var. *flavicans* (*S. flavicans* Hook. fil. et Tayl.), *Lecidea avium*, *L. inactiva*, *L. cyanosarca* + var. *superfusa*, *L. leucozonata*, *Catillaria melastegia* f. *mesoleucodes* (*Lecidea melastegia* Nyl. f. *mesoleucodes* Nyl.), *C. leucochlora* (*Parmelia leucochlora* Mont.) with f. *typica* and f. *laevigata*, *C. theobromina*, *Megalospora versicolor* A. Zahlbr. var. *microcarpa*, *Bacidia arceutina* (Ach.) Arn. var. *hyposcotina*, *B. delapsans*, *Lopadium leucoanthum* (Sprgl.) A. Zahlbr. var. *albidius*, *Rhizocarpum microspermum*, *R. obscuratum* (Ach.) Mass. var. *deminutum*, *Stereocaulon proximum* Nyl. var. *compactius*, *Pertusaria polycarpa* Krph. var. *monospora*, *P. hadrocarpa*, *P. Skottsbergii*, *Lecanora masafuerensis*, *L. Ingae*, *L. albellina* Müll. Arg. var. *validior*, *L. gelida* (L.) Ach. f. *nuda* and f. *leprosula*, *L. patagonica* A. Zahlbr. f. *sorediosula*, *Myxodictyon lopadioides*, *Parmelia conspersa* (Ehrh.) Ach. var. *oblecta*, *P. microsticta* Müll. Arg. f. *divisa*, *Usnea Steineri* A. Zahlbr. var. *subtorulosa*, *Caloplaca clandestina*, *C. Selkirkii*, *C. rubina* + var. *evolutior*, *C. isidioclada*, *C. subcerina* (*Lecanora erythroleuca* var. *subcerina* Nyl.) with var. *aurantiaca*, *C. elegans* (Link) Th. Fr. var. *australis* (*Xanthoria parietina* var. *australis*, A. Zahlbr.), *C. orthoclada*, *Buellia concinna* Th. Fr. var. *oceanica*, *B. siphoniatala*, *Pyxine curvatula*, *Anaptychia hypoleuca* (Muhl.) Mass. var. *colorata* (*Pseudophyiscia hypoleuca* Muhl.) var. *colorata* A. Zahlbr.), *A. dactyliza* (*Physcia speciosa* var. *dactyliza* Nyl.) with f. *pectinata*. Critical remarks are given in many places. The colored plates are remarkably beautiful and exact; they contain habitat figures of 11 species. In an appendix K. KEISSLER enumerates 5 parasitic microfungi, found on the lichens.—C. Skottsberg.

BACTERIA

3847. ARLONG, ET MALARTRE, FERNAND. *Recherches histo-bactériennes comparatives sur des cultures de Bacille tuberculeux, d'actinomycose, et d'Aspergillus sur pomme de terre*. [Comparative researches on cultures of *B. tuberculosis*, of an actinomycosis, and of *Aspergillus* on the potato.] *Compt. Rend. Soc. Biol.* 92: 1303-1306. 1925.—Since the tuberculosis bacilli go through many evolution forms it has been proposed by some authors to place them with pathogenic fungi rather than with the bacteria. When cultivated on the potato, however, the bacteria behave entirely differently from the 2 filamentous fungi named. The bacteria do not penetrate into the interior of the potato but rest only on the surface. The other fungi penetrate deeply into the substrate and this character clearly separates or distinguishes the bacteria from the others.—Oran Raber.

3848. LEVINE, MICHAEL. *Morphological changes in Bacterium tumefaciens*. *Science* 62: 424. 1925.—A definite cycle of size and form changes has been observed in studies of daily fixations of inoculated tissues.—C. J. Lyon.

3849. ROSEN, H. R. *The number and arrangement of flagella of the typhoid fever germ, Bacillus typhi*. *Science* 62: 498. 1925.—By the use of a new flagella-staining method to be described elsewhere, the writer has obtained dependable preparations of *Bacillus typhi* Gaffky. They show a variable number of flagella but rarely more than four. The arrangement of the flagella may be either polar, lateral or both. The shape of the organism is unchanged by the staining method used.—C. J. Lyon.

3850. WYANT, ZAE NORTHROP. *Flat sours. I. An interesting thermophile encountered in canned string beans*. *Michigan Agric. Exp. Sta. Tech. Bull.* 59. 1-10. 1923.

3851. WYANT, ZAE NORTHROP, AND ROBERT L. TWEED. Flat sours. II. Bacteriological studies of flat sours of cold packed canned peas. Michigan Agric. Exp. Sta. Tech. Bull. 59. 11-29. 1923.

3852. WYANT, ZAE NORTHROP. Poisoning from *Bacillus botulinus*. Cause, prevention, treatment. Michigan Agric. Exp. Sta. Circ. 47. 1-8. 1921.—A popular account of botulism with discussion of history and cause of the trouble and a few characteristics of the organism. —*Ernst A. Bessey*.

MYXOMYCETES

3853. ANONYMOUS. [Rev. of: LISTER, ARTHUR. A monograph of the mycetozoa: a descriptive catalogue of the species in the herbarium of the British Museum. 3d. ed. rev. by Gulielma Lister. xxvii + 296 p. 223 pl. British Museum [Natural History]: London, 1925.] Nature 116: 390. 1925.

3854. BROEKSMIT, T. The Myxomycetes in the Rijks-Herbarium at Leyden. Mededeel. Rijks Herb. 50: 1-5. 1925.—Broeksmit grouped together all the collections found in the Rijks Herbarium comprising the Myxomycetes into 2 groups. The 1st group consists of 4 portfolios which contain principally the collections of Persoon and the collection of Lister. The 2nd group in one portfolio contains collections of Hall, Hankarl, Buse, Junghuhn, and Wagner. In this article the author gives a general description of each collection, following Lister's nomenclature, 1911. Other collections described are those of Ellis and Everhart and of Otto Jaap. Mention is also made of the small collections of Saccardo, Schinz, Rabenhorst, and Klotzsch.—*M. F. L. Fitzpatrick*.

3855. FRIES, ROB. E. Die Myxomyceten der Juan Fernandez-Inseln. [The Myxomycetes of the Juan Fernandez Islands.] In: SKOTTSBERG, C. The natural history of Juan Fernandez and Easter Island. Vol. 2. P. 55-58. 1920.—Skottsberg's collection contains 16 species, of which 14 had not been collected before on these islands. All are more or less cosmopolitan. —*C. Skottsberg*.

PALEOBOTANY AND EVOLUTIONARY HISTORY

EDWARD W. BERRY, *Editor*

(See also in this issue Entries 3556, 3743, 3762)

3856. GOTHAN, WALTER. Sobre restos de plantas fósiles procedentes de la Patagonia con un apéndice: Plantas réticas de Marayes (Prov. de S. Juan). [Fossil plants collected in Patagonia with an appendix on Rhaetic plants from Marayes, province of San Juan.] Bol. Acad. Nacion. Cien. Argentina 28: 197-212. Pl. 1-10. 1925.—The author describes in detail silicified material from Belgrano in the territory of Santa Cruz representing *Dadoxylon* sp. (wood), and *Araucaria windhauseni* n. sp. (cone). The material is said to be of middle Triassic age. From Marayes, province of San Juan, the following plants, said to be of Rhaetic age, are briefly discussed: *Cladophlebis* n. sp., aff. *sublobata* Johansson, *Desmophyllum* sp., and *Dicroidium odontopteroides* (Morris).—*E. W. Berry*.

3857. HILL, HAROLD A. Evolutionary botany. Pharm. Jour. 114: 325. 1925.—It is generally supposed that life began in some aquatic medium. Differentiation into plants and animals came early: Some organisms developed their photosynthetic mechanism and continued to derive their energy direct from the sun; others developed digestive organs and derived their energy from digested photosynthetic organisms. Originating in an aquatic environment some organisms were brought face to face with the problem of adapting existence to a life on land, with air instead of water as a medium. Undoubtedly many failed to solve the problem at all and became extinct; others partially solved it and survived in inferior stations; others were quite successful, as in the angiosperms in which almost every trace of the original equipment has been wiped out and replaced by something more suitable for sub-aerial existence. In the algae we can trace the gradual development of complexity in structure as well as the development of reproductive organisms. In the Bryophyta a fairly well

developed gametophyte generation is seen. The Pteridophyta exhibit interesting features from the evolutionary standpoint, particularly in the development of the stele and of the seed, while in the Spermatophyta splendid studies on evolutionary development, especially in the conifers, have been made.—*E. N. Gathercoal.*

3858. HIRMER, MAX. Zur Kenntniss der Organstellung und der Zahlenverhältnisse in der Gattung *Calamostachys* Schimper. [Position of organs and numerical relations in the genus *Calamostachys*.] *Flora* 118-119: 227-256. Pl. 2-4, 22 fig. 1925.—This work, dealing chiefly with *C. Binneyana* and *C. Ludwigi*, treats of the relation of the superimposed sporangia to the bracts.—*A. G. Stoekey.*

3859. JONGMANS, W. Beiträge zur Kenntniss von *Calamites undulatus* Sternb. [Contributions to the knowledge of *C. undulatus*.] *Mededeel. Rijks Herb.* 2: 41-57. 12 fig. 1923.—By means of specimens of *C. undulatus* from the Holland coal beds and by comparison with specimens from collections in Berlin and Liege as well as with a few specimens from the private collection of A. Renier, the author endeavors to show, at least for the groups *Eucalamites* and *Calamitina*, that the present classification does not answer for *Calamites* and that a thorough study and reclassification of *Calamites* should be undertaken.—*M. F. L. Fitzpatrick.*

3860. JONGMANS, W. Das Vorkommen der fossilen Pflanzen im Kohlenbecken von Süd-Limburg. [The occurrence of fossil plants in the coal basin of South Limburg.] *Mededeel. Rijks Herb.* 3: 59-71. 1923.—The author gives the distribution and localities of fossil plants found in 5 different mines in the coal basin of South Limburg and a comparison of the mines.—*M. F. L. Fitzpatrick.*

3861. LECLERCQ, SUZANNE. Les végétaux à structure conservée du charbonnage de Werister. [The plants with structure from the mine of Werister.] *Bull. Soc. Belge. Géol.* 34: 31-32. 1924 [1925].—The author announces the collection and anatomical study of several tons of dolomitic nodules containing structural material of plants from the Bouxharmont bed (Carboniferous) in the mine at Werister near Liege. The following have been determined: *Stigmariaceae*, a *Stigmaria* with centripetal wood, *Botryopteris ramosa* and *B. cylindrica*, several *Zygopteridae*, abundant *Calamites*, *Calamostachys*, *Lepidodendron selaginoides*, and *Lepidodendron megasporae*. A detailed account is in preparation.—*E. W. Berry.*

3862. PIA, J. Die Gliederung der alpinen Mitteltrias auf Grund der Diploporen. [The succession of the Alpine Middle Triassic based on the Diploporellidae.] *Akad. Anzeig. Wien* 23: 214-217. 1925.—This is a preliminary account of the authors' extensive investigations. It is presumed that the Dasycladaceae will prove among the most important type fossils of the middle and upper Triassic of the Alpine geosyncline. The following points may be considered as already established: The middle Triassic begins with the first appearance of Triassic Diplopores in Europe and ends with the extinction of *Diploporella annulata*. The Anisian stage (lower middle) is chiefly distinguished by *Physoporella pauciforata*, the Ladinian (upper middle) by *Diploporella annulata*. Within the Anisian stage a higher, Neoanisian zone is characterized by *Teutloporella triasina*, *Diploporella annulatissima*, and a few less common species. It is expected that further investigations will enable the authors to make subdivisions in the Ladinian stage also.—*Author.*

3863. RUBCZYŃSKA, M., UND J. ZABLOCKI. Über zwei fossile Koniferenhölzer von Posadza. [Two forms of fossil coniferous wood from Posadza.] *Bull. Int. Acad. Polonaise Sci. & Let.* 3: 433-436. Pl. 31. 1924.—The authors describe *Piceoxylon laricinum* Krausel and *Podocarpoxylon* sp. from the upper Miocene of Posadza near Cracow in Poland.—*E. W. Berry.*

3864. RUEDEMANN, R. Some Silurian (Ontarian) faunas of New York. *New York State Mus. Bull.* 265. 1925.—The following supposed algae are described: *Callithamnopsis silurica*, *Chondrites verus*, *Morania ? bertiensis* and *Sphenophycus* sp. All are new. In addition, the paper contains an account of a Silurian terrestrial plant described by W. Goldring as *Hostiella silurica*.—*E. W. Berry.*

3865. RUEDEMANN, R. The Utica and Lorraine formations of New York. *New York State Mus. Bull.* 262. 1925.—In this mainly paleozoological paper the following supposed algae are described from the Ordovician of New York: *Buthotrephis subnodosa* Hall, *Sphenophycus latifolium* (Hall), *S. lobatus* n. sp., *S. succulentum* n. sp., *Discophycus typicale* Walcott, *Delesserites salicifolia* n. gen. and n. sp., *Palaeophycus fluctuans* n. sp., and *Rhombodictyon irregulare* n. sp.—*E. W. Berry.*

3866. SCHLICKUM, A. Die Pflanzenreste aus den Bimssteintuffen des Kondetals bei Winnigen a. d. Mosel und des Brohltals in der Vordereifel. [The plant remains of the pumicetuffs of the Konde Valley near Winnigen on the Moselle and of the Brohl Valley in the Eifel.] Verh. Naturh. Ver. Preus. Reinh. u. Westfalens 81: 47-91. Pl. 1. 1925.—The author discusses the following plants identified from these 2 localities: *Pinus silvestris* L., *Abies alba* Mill., *Typha latifolia* L., *Sparganium ramosum* Huds., *Carex* cf. *acuta* L., *C.* cf. *pseudocyperus* L., *Populus hybrida* M. B., *P. tremula* L., *P. nigra* L., *Salix viminalis* L., *S. caprea* L., *S. cinerea* L., *S. aurita* L., *Betula verrucosa* Ehrh., *B. pubescens* Ehrh., *B. pubescens* var. *parvifolia* Schneider, *B. humilis* Schrank, *Erle* sp., *Quercus robur* L., *Urtica dioeca* L., *Cotoneaster vulgaris* Lindl., *Amelanchier vulgaris* Moench., *Rosa* cf. *canina* L., *Prunus padus* L., *P. avium* L., *Anthyllis vulneraria* L., *Vicia cracca* L., *Euonymus europaeus* L., *Acer campestre*, *Rhamnus frangula* L., *Hypericum montanum* L., *Cornus sanguinea* L., *Vaccinium vitisidaea* L., *Lycopus europaeus* L., *Verbascum taphiforme* Schrad., *V. lychnitis* L., *V. nigrum* L., *Galium verum* L., *G. aparine* L., *G. cruciata* Scop., *Lonicera xylosteum* L., *Valeriana officinalis* var. *sambucifolia* Mik., *Eupatorium cannabinum* L. (?), *Achillea millefolium* L., and *Onopordon acanthium* L. The exact horizon in the Pleistocene cannot be determined.—E. W. Berry.

3867. STANIER, X. Nodules dolomitiques avec végétaux à structure conservée du houiller belge. [Dolomitic nodules with structural plant material from the Carboniferous of Belgium.] Bull. Soc. Belge. Géol. 34: 26-30. 1924 [1925].—An account of the geographic and geologic occurrence of nodules containing petrified plant remains in the Carboniferous of Belgium.—E. W. Berry.

3868. STARK, P. Der gegenwärtige Stand der pollenanalytischen Forschung. (Sammelreferat.) [The present position of pollen analysis studies.] Zeitschr. Bot. 17: 89-125. 1 illus. 1925.—This paper gives a comprehensive survey of recent work in tracing postglacial forest successions by means of the pollens which are preserved in sedimentary deposits. Methods and results are presented and a bibliography is appended. The silt or other material to be tested is boiled down in 10% KOH and the residue taken up in glycerine for microscopic examination. Decalcification, desilification and centrifuging may be employed if necessary, without altering the results. Various sources of error are discussed, the most important being differences in rate of pollen production, and the relative preservation of different pollens. Successions as traced in Sweden, Norway, Finland, Russia, Denmark, Great Britain, and various parts of Germany are given. For the most part these accord with the Blytt-Sernander hypothesis of climatic succession, and local differences seem to be explained by the difference of continental and oceanic trees in pathway of glacial retreat. The former retreated south-eastward, the latter southwestward. In very generalized terms the postglacial series has been Pine-Birch, Mixed Oak Forest, Beech, and Spruce.—P. B. Sears.

3869. WALKOM, A. B. Notes on some Tasmanian Mesozoic plants. Pap. & Proc. Roy. Soc. Tasmania 1924: 73-89; 1925: 63-74. Pl. 9. 1925.—From beds in Tasmania considered to be of Rhaetic age, but containing several survivors from the antecedent Glossopteris flora, the author records 2 Arthrophytes, 20 Pteridophytes, 5 Cycadophytes, 4 Ginkgoalean forms and the genera *Czekanowskia* (?) and *Phoenicopsis*. The following are described as new: *Cladophlebis johnstoni*, *Thinnfeldia acuta*, *Johnstonia dentata* (belonging to a new fern genus of unknown relationship), *Linguifolium diemenense*, and *Chiropteris tasmanica*.—E. W. Berry.

3870. ZABLOCKI, JAN. La flore tertiaire de Chodziez (Posnanie). [The Tertiary flora of Chodziez.] Bull. Int. Acad. Polonaise Sci. & Let. 3: 399-406. Pl. 25-28. 1924.—This flora occurs in the Miocene clays of Chodziez near Posnanie in Poland and comprises *Hypnum lycopodioides* Weber, *Glyptostrobus europaeus* Heer, *Musophyllum styriacum* Ettings., *Betula subpubescens* Goepp., *Alnus kefersteinii* Goepp., *Carpinus grandis* Unger, *Carpiniphyllum caudatum* Reimann, *Ulmus carpinoides* Goepp., *Rhododendron retusum* Goepp., *Cassia phaseolites* Unger and *Phaseolites eutycho* Unger. The horizon is about the same as that of the large flora found at Schosnitz in Silesia, described by Goeppert in 1855 and revised by Krausel in 1919.—E. W. Berry.

PATHOLOGY

FREDERICK V. RAND, *Editor*LILLIAN C. CASH AND HARRY BRAUN, *Associate Editors*

(See also in this issue Entries 3052, 3056, 3057, 3059, 3060, 3072, 3080, 3081, 3082, 3093, 3095, 3119, 3123, 3128, 3135, 3155, 3158, 3165, 3181, 3183, 3187, 3188, 3191, 3194, 3196, 3205, 3217, 3230, 3241, 3279, 3303, 3342, 3363, 3417, 3418, 3419, 3420, 3460, 3470, 3471, 3474, 3521, 3524, 3540, 3555, 3567, 3569, 3570, 3591, 3593, 3609, 3611, 3630, 3636, 3643, 3647, 3651, 3660, 3672, 3673, 3682, 3688, 3689, 3698, 3702, 3737, 3801, 3802, 3804, 3810, 3811, 3813, 3815, 3816, 3818, 3819, 3829, 3830, 3831, 3832, 3836, 3837, 3846, 3847, 3848, 3961, 3970, 3971, 4116, 4117, 4118, 4130, 4178, 4180, 4212, 4304)

DISEASES CAUSED BY FUNGI

3871. ANONYMOUS. The successful control of blue mold decay in citrus fruits. Brogdite-Brogdex treatment in California reduces losses to less than one per cent and permits shipment without icing—process now available to Florida growers by reason of license rights granted Skinner Machinery Company. *Citrus Indust.* 6¹²: 5, 8. 1925.—The writer gives the results obtained in California with a combination of 2 recently patented processes in which the fruit is treated first with borax and then with paraffine to accomplish the double purpose of effectually controlling blue mold and at the same time of preserving the fruit in a plump and unwithered condition. This patented process is said to save not only tremendous losses from decay but also the customary refrigeration charges.—*Arthur S. Rhoads.*

3872. AGOSTINI, ANGELA. Una nuova malattia dell' *Acacia Baileyana* F. Muell. (*Phyllosticta Pollaccii* n. sp.). [A new disease of *Acacia Baileyana* F. Muell.] *Rivist. Patol. Veg.* 15: 113-122. *Fig. a-d.* 1925.—In a disease of *Acacia Baileyana* F. Muell. the leaflets begin to turn yellow at the tips, later becoming brown and then ashen colored. As the disease progresses the leaflets show all these colors in zones and in the oldest or ashen colored zone pycnidia are found. The fungus is described as *Phyllosticta Pollaccii* n. sp. There are also given a review of the uses made of different species of *Acacia* and a classified list of the different fungi which have been reported on plants of this genus.—*F. M. Blodgett.*

3873. ANDERSON, P. J. Comparative susceptibility of onion varieties and species of *Allium* to *Urocystis cepulae*. *Jour. Agric. Res.* 31: 275-286. 1925.—Fifty-four varieties of cultivated onions were tested for susceptibility. None of them showed any promising degree of resistance. Thirty-nine other species of *Allium* were also tested; 8 were found immune, while the other 31 showed varying degrees of susceptibility. Other species of *Urocystis* which occur on *Allium* spp. are discussed and compared with *U. cepulae*. The writer considers all of them distinct from the true onion smut fungus. All the evidence at hand indicates that this parasite lived originally on some wild American species of *Allium* and thence passed over to the cultivated onion.—*Author.*

3874. BENNETT, C. W. A *Phoma* root rot of celery. *Studies in Michigan celery diseases I.* *Michigan Agric. Exp. Sta. Tech. Bull.* 53. 1-40. *Pl. 1-8.* 1921.—At numerous places in Michigan as well as in New York and Ohio and in Germany and Holland a dark-colored rot of celery roots has been reported. Usually it is one of the minor diseases but occasionally it destroys the whole crop over limited areas. Only the underground portions of the plant are commonly attacked, although it has been reported also on the leaves. By inoculation it was shown to be equally destructive to parsley and celery under greenhouse conditions. It is much less virulent on carrot, parsnip and caraway. *Conium maculatum* and *Anethum graveolens* remained free in spite of heavy inoculation. The symptoms on celery are detailed. The causal organism is *Phoma apiicola* Klebahn. The mycelium and pycnidia are carefully described and illustrated. Infection takes place by direct penetration of the epidermal cells. In young plants infection is easily effected; in older plants much less so, except where there are wounds. Detailed physiological studies of the organism are given. The optimum conditions for growth of the organism and for infection of the host are a temperature of about 18°C., an abundance of moisture and a large supply of oxygen. The disease thus reaches its

maximum destructiveness in spring and fall, the midsummer crop being free from attack. Overwintering was shown to take place in field trash. Control methods include planting out of healthy plants, destruction of trash and, in case of severe infection, rotation of crops.—*Ernst A. Bessey.*

3875. BRITTLEBANK, C. C. **Tomato diseases.** Jour. Dept. Agric. Victoria 22: 433-434. 1924.—The description of the disease, symptoms, and control are discussed briefly for "black dot" root disease, closely resembling *Colletotrichum tabificum*, and Verticillium wilt (similar to *Fusarium lycopersici*). Varietal tests on 10 varieties of tomatoes resistant to Fusarium Wilt in the U. S. A. are reported.—*Wm. E. Lawrence.*

3876. CAMPANILE, G. **Sulla Phoma betae Frank come agente della moria delle bietole nei semenzai in Italia.** [A beet disease caused by Phoma Betae Frank.] Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. Roma 4: 39-47. 1 fig. 1923.—*Phoma betae* injures sugar-beet in seed beds in Italy. Attacked shoots differ from those infected by root-rot (*Pythium Debaryanum*) in having the tip of the root black and turgid, while in the latter the point at the junction of the root and hypocotyl is first softened, with subsequent browning of the tissues. The immature pycnidia may have hyaline mycelial appendages much more numerous around the large ostiole, simulating a true beak destined to fall off later as the pycnidium matures; the last to fall are those around the ostiole; the beak-like appendages seem destined to form a canal for the glutinous cirrus of spores. The mature pycnidia remain perfectly glabrous. The disease has not been reported before in Italy. The author gives the essential characteristics, methods of prevention and the necessity for germinating the seed in a germinator to detect the presence of the fungus.—*R. Ciferri (translated by L. C. Cash).*

3877. CARNE, W. M. **Blue mould on oranges.** Jour. Dept. Agric. Western Australia, 2nd ser. 2: 286-292. 1925.—The blue mold is the greatest cause of financial loss to the citrus industry in Western Australia. A comprehensive description of the fungus, the secondary causes of blue mold decay, extent of the losses, and the evolution of the Florida citrus industry are discussed.—*P. J. Olson.*

3878. CARNE, W. M. **Cereal smuts (continued from page 19).** Jour. Dept. Agric. Western Australia 2nd ser. 2: 233-240. 4 fig. 1925.—Detailed descriptions and life histories are given of loose and covered smuts of barley and oats, and of loose or flying smut of wheat. Methods of treatment and prevention are included.—*P. J. Olson.*

3879. CASTELLA, FRANCOIS DE, AND C. C. BRITTLEBANK. **Oidium of the vine. Uncinula spiralis (Berkeley and Cooke).** Jour. Dept. Agric. Victoria 21: 673-685, 738-734. Fig. 1-11. 1923; 22: 98-108. Fig. 1-6. 1924.—This is a comprehensive treatment of the powdery mildew (*Uncinula spiralis*) of grapes. The history, conditions for growth, influence of the variety, appearance, life history, treatment, and methods of applying fungicides are given.—*Wm. E. Lawrence.*

3880. CAVARA, F. **Di una infezione crittogamica del Lupino (Mastigosporium Lupini (Sor.) Cavara).** [A cryptogamic disease of lupine.] Rivist. Patol. Veg. 14: 13-16. 1924.—In a planting of *Lupinus albus* L. made in the botanical garden of Naples after the plants were 15 to 20 cm. high, circular ferruginous spots appeared on the leaves which soon rolled up and withered. The attack continued through December and January, when the temperature often reached -5-6°C. The fungus previously described by Sorauer as *Pestolozzia Lupini* is transferred to the genus *Mastigosporium* Riess.—*F. M. Blodgett.*

3881. COMANDUCCI, CORTINI, J. **Il Fusicladium cerasi sulle pesche.** [Fusicladium cerasi on the peach.] Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. Roma. 1: 107. 1920.—*Fusicladium cerasi* (Rabh.) Sacc. attacks only the fruits of the peach, forming small olive-brown spots which are round and somewhat confluent, with indefinite edges and velvety surface. Such spots decrease the value of the fruit decidedly, although it develops normally even where infected. Winter and spring treatments with copper salts are advised.—*R. Ciferri (translated by L. C. Cash).*

3882. CUNNINGHAM, G. H. **Cereal smuts: An illustrated key to the New Zealand species.** New Zealand Jour. Agric. 30: 374-378. 6 fig. 1925.

3883. CUNNINGHAM, G. H. **Incidence of apple canker (Nectria galligena Bres.) in New Zealand.** New Zealand Jour. Agric. 31: 102-103. 1 fig. 1925.—Report on the occurrence of Nectria canker in New Zealand. Control measures are given.—*N. J. Giddings.*

3884. CURZI, MARIO. Il parassitismo del *Verticillium tracheiphilum* Curzi e la diffusione della tracheovorticilliosi del peperone in Italia. [The parasitism of *Verticillium tracheiphilum* Curzi and the diffusion of the tracheovorticilliose of peppers in Italy.] Rivist. Patol. Veg. 15: 145-160. Fig. 1-3. 1925.—Following a previous article (Boll. Soc. Bot. Italiano 6: 114) and anticipating another (Nuovo Giorn. Bot. Italiano 32: 380-395), successful infections are reported from inoculations (June-September) made on peppers (*Capsicum annuum*) in the base of the stem, using pure cultures of *Verticillium tracheiphilum* Curzi. Infection of the growing plants causes a slackening of growth and a dwarfing of all parts of the plant with frequently no withering of the foliage or with a slowly progressive withering proceeding in a centrifugal direction. In fully developed plants a wilt was obtained with rapid withering proceeding in a centripetal direction. Inoculated branches always wilted. Rolling and wilting are commonly present together in cultivated fields affected with this disease, one or the other being predominant, depending on the variety and the cultural conditions. Extensive plantings and those made in dry soil are more likely to be affected. This disease is very wide spread in Italy, and has been isolated from numerous specimens of peppers collected in 10 regions. The same fungus has been isolated from *Solanum melongena* L. affected by wilt and cultivated in the same fields with peppers.—F. M. Blodgett.

3885. FABRE, J. H. Soufre sublimé et soufre trituré. [Sublimed and ground sulphur.] Prog. Agric. et Vitic. 74: 279-284. 1920.—The author favors sublimed sulphur for a fungicide in vineyards, and describes briefly the methods of preparation of each kind and the physical differences between them.—E. L. Proebsting.

3886. FONZES-DIACON. Les sels de cuivre toxiques pour le mildiou. [Copper salts toxic to mildew.] Prog. Agric. et Vitic. 75: 561-564. 1920.—A reply to Mme. and M. Villedieu.—E. L. Proebsting.

3887. GILL, L. S. Peridermium Harknessi Moore in the Western yellow pine tops. Phytopathology 15: 617. (Note.) 1925.

3888. KIGHTLINGER, C. V. Preliminary studies on the control of cereal rusts by dusting. Phytopathology 15: 611-613. 1925.—Preliminary tests with the dusting of oats in the greenhouse and field for the control of *Puccinia coronata* with a 90-10 sulphur lead-arsenate dust have been very favorable. It is thought that the lead-arsenate dust has no fungicidal value. Further tests are under way with wheat and rye as well as oats.—Naomi Chapman.

3889. KIRBY, ROBERT S. The take-all disease of cereals and grasses caused by *Ophiobolus cariceti* (Berkeley and Broome) Saccardo. New York [Cornell] Agric. Exp. Sta. Mem. 88. 1-45. 3 pl., 3 fig. 1925.—The disease was first reported in America from New York State in 1920 but it is now found to be practically coextensive with the winter wheat-producing area of the state. Losses are estimated at 0.3-2%.—Take-all was found in the field on the following grasses: *Agropyron repens*, *Agrostis palustris*, *Phleum pratense*, *Poa compressa*, *Triticum dicoccum*, *T. spelta* and *T. vulgare*. Inoculations made in the greenhouse gave infection on 2 of the 14 species of Panicoideae and on 87 of the 142 Poacoideae that were tested. Of the cultivated cereals, the disease was found in the field only on wheat and rye. In New York, winter wheat is the only one of the cereals that is seriously damaged.—Of 10 varieties of wheat tested in the field, Forward and Dawson were most resistant to the disease but neither is immune. The disease is discussed in its historical and economic aspects and its effect under various conditions is described in detail.—*Ophiobolus cariceti* has been grown in pure culture and its cultural and reproductive characters are described and illustrated. The existence of 2 sexually different strains is not confirmed. The fungus grows best on an alkaline medium and any substance added to the soil which produces an acid condition reduces the amount of disease, although in 1 field test the added substances also affected adversely the growth of wheat.—The disease apparently has been present in the U. S. A. for many years so that quarantine measures are regarded as ineffective. The most likely means of control seems to be eradication by means of a suitable rotation of crops.—A bibliography is appended.—D. Reddick.

3890. KLOTZ, L. J. A study of the early blight fungus, *Cercospora apii* Fres. Studies on Michigan celery diseases II. Michigan Agric. Exp. Sta. Tech. Bull. 63. 1-43. Pl. 1-9. 1923.—This disease of celery causes considerable loss to celery growers, occurring in all the celery growing regions of the world. Inoculation experiments with pure cultures from celery

gave infections on celery and celeriac, but not on carrot, coriander, and fennel. Symptoms are given in detail. A similar fungus isolated from carrot would not infect celery. Healthy plants were infected by shaking over them some celery trash that had been kept out-of-doors over winter. Apparently the fungus remains alive in the overwintering trash and produces new spores in the spring. Under humid conditions infection takes place through the stomata in 6 hours or longer. The central heart leaves are much less easily infected than the mature outer leaves. The disease develops best at 27-32°C. The death point for moist conidia, mycelium, and spores was 50-52°C. for 10 minutes. Conidia germinated in media at pH 4.5-9. The fungus will not grow in the complete absence of oxygen but will grow fairly well even if $\frac{3}{4}$ of the air is replaced by CO₂, N₂ or illuminating gas; when CO is present the cultures become pink. Desiccation of diseased leaves for 170 days did not kill the fungus, but herbarium specimens 9-32 years old gave no growth. Conidia are not forcibly thrown off but are detached by air currents. No marked resistance of any variety was observed. Freely watered plants on cool soil develop much less disease than on drier, warmer soil. Of several fungicides tested, Bordeaux mixture was the most effective.—*Ernst A. Bessey.*

3891. KOCK, G. *Der Kartoffelkrebs in Oesterreich.* [Potato wart in Austria.] *Wiener Landw. Zeitg.* 75: 377. 1925.—An outbreak of potato wart has been discovered in St. Anton (Vorarlberg) involving about 15 acres of the variety Deodara from seed grown in Stuttgart; neither the original stock nor its progeny elsewhere showed this disease. A survey of the locality indicates that the disease is restricted to the 1 infection.—*F. Weiss.*

3892. LIRO, J. I. *Über das Auftreten von Ustilago milii in den Rispen der Nährpflanze.* [The appearance of *U. milii* in the panicles of crop plants.] *Ann. Soc. Zool.-Bot. Fennicae Vanamo* 1: 61-64. 1923.—*Ustilago milii* (Fuckel) Liro appeared in the experimental garden in 1920 only on the leaves; in 1920-1921 in several cases only on the panicles and indeed on all the spikelets.—*K. Linkola (translated).*

3893. MAFFEI, LUIGI. *Sul parassitismo di Phomopsis cinerescens (Sacc.) Trav. sopra i rami del fico.* [Parasitism of *Phomopsis cinerescens* (Sacc.) Trav. on the branches of figs.] *Rivist. Patol. Veg.* 15: 37-47. *Fig. 1-6.* 1925.—A fungus causing a disease of fig branches, previously described by Salmon and Wormald in England under the name *Phoma cinerescens* and by Drobish in California, is reported for the 1st time as causing damage in Italy where it severely injured 2 trees in the province of Pavia. Inoculation experiments were successful. No ascogenous stage was found.—*F. M. Blodgett.*

3894. MONTMARTINI, L. *Svernamento del Gymnosporangium clavariiforme (Jacq.) Rees sopra il Crataegus Oxyacantha L.* [Overwintering of *Gymnosporangium clavariiforme* (Jacq.) Rees on *Crataegus Oxyacantha* L.] *Rivist. Patol. Veg.* 15: 85-86. 1925.—Observing that for some years hedges of *Crataegus Oxyacantha* L. at Montubeccaria showed the aecidio-spore form (*Roestelia lacerata* Mer.) of *Gymnosporangium clavariiforme* (Jacq.) Rees, with no junipers growing within a distance of some kilometers, tests were made to determine whether the fungus winters on *Crataegus*. Some of the infected branches were marked in the spring. When the buds began to swell the following March on twigs brought in at the end of December, mycelium like that of the *Roestelia* stage was found in the young leaves. Aecidia developed early in April on the marked branches of the plants in the open and thus at a time too early for the dissemination of sporidia. This indicates that the mycelium of *Roestelia lacerata* may persist in perennial form in the buds of the host plant.—*F. M. Blodgett.*

3895. NANNIZZI, ARTURO. *Un nuovo parassita della Cobaea scandens Cav. (Septoria oligocarpa n. sp.).* [A new parasite of *Cobaea scandens* Cav.] *Rivist. Patol. Veg.* 15: 1-4. 1925.—Very numerous small fungus spots were found on the leaves of a specimen of *Cobaea scandens* Cav. in the Botanical Garden at Siena. Since no *Septoria* has been reported previously on this host the fungus is described as *S. oligocarpa* n. sp.—*F. M. Blodgett.*

3896. NEAL, D. C. *Spraying experiments for pecan scab control in Mississippi in 1923.* *Mississippi Agric. Exp. Sta. Circ.* 53. 1-4. 1924.—Bordeaux mixture, 4-4-50, was found effective in combatting pecan scab.—*J. F. O'Kelly.*

3897. NEILL, J. C. *Loose smut of wheat.* *New Zealand Jour. Agric.* 31: 161-163. 2 fig. 1925.—Hot water treatment for loose smut was found to injure light grains much more seriously than heavy grains. In laboratory tests, untreated light grains gave over 98%

germination and grew even more rapidly than heavy grains, but the latter showed much higher germination in the field. The amount of smut in untreated grain was practically the same for both heavy and light seed.—*N. J. Giddings*.

3898. NEILL, J. C. Stinking smut of wheat. *New Zealand Jour. Agric.* 30: 302-313. 1 graph. 1925.—Copper carbonate, copper sulphate, formalin, Uspulun, Germisan, Semesan, Clark's wheat protector, and the modified Jensen hot water treatment were tested as to effectiveness for smut control and effect upon germination of seed. Sixteen different treatments or methods were used, and 4 varieties of wheat—Pearl, Hunter's, Purple Straw Tuscan, and Solid Straw Tuscan—were used. Data were secured as to germination, number of heads, height of plants and percentage of smutted heads. The results indicate that copper carbonate and members of the group, Uspulun, Semesan and Germisan, are the most desirable for treatment of wheat against stinking smut.—*N. J. Giddings*.

3899. NEILL, J. C. Stinking smut of wheat. *New Zealand Jour. Agric.* 31: 24-25. 1925.—Formalin was found to injure germination in some cases, but Clark's Wheat Protector appeared slightly to improve germination.—*N. J. Giddings*.

3900. PARKER, WILFRED H. Report on maturity and yield trials of first early potatoes, 1923. *Jour. Nation. Inst. Agric. Bot.* 3: 3-14. 1925.—These trials, unlike those of 1921 and 1922, included both varieties susceptible to and immune from wart disease.—*Frederick V. Rand*.

3901. PEYRONEL, B. Il marciume amaro o marciume del cuore delle mele e delle pere. [Bitter rot of apple and pear.] *Boll. Mens. [Inform. e Notiz. R. Staz. Pat. Veg. Roma]* 2: 23-27. Fig. 1-3. 1921.—Externally the fruits appear healthy until the disease is far advanced; sometimes they may be altered externally without becoming mummified. In longitudinal sections the pulp of the zone around the seed carpels is darkened, soft and bitter. In the interior of the cavity and on the surface of the seed is seen a pink efflorescence due to fructifications of *Trichothecium roseum* Link. The bitterness may slowly invade the fruit pulp. The fungus penetrates the interior of the apple or pear through the calyx in cavity, developing probably for the most part saprophytically on the dead remnants of the calyx, stem and style, and spreading through the style of the core and from there out into the pulp. In the apple, however, penetration of the fungus takes place from the enlargement of the calyx along the fibro-vascular bundles which extend from the peduncle to the seed-cavity.—To prevent this infection it is advisable to keep the apples dry and in thin layers.—*R. Ciferri*.

3902. PINOY, P. E. Sur la maladie du "Bayoud" des palmiers de Figui. [The "Bayoud" disease of the Figui palm trees.] *Compt. Rend. Soc. Biol.* 92: 137-138. 1925.—This disease of the oasis of Figui is rapidly spreading. In the brown lesions on the stem, petioles, and leaf blades are always found the conidia of *Neocosmospora vasinfecta* or *Fusarium vasinfectum* but they are not the initial cause of the disease and will not produce the disease experimentally. The origin of the trouble rests in the impermeability of the subsoil coupled with poor drainage which permits water to remain too long about the roots. When the roots have been weakened in this way, the fungi are able to attack the plant. It is hoped that a hardy and resistant strain of palms may be developed; destruction of diseased trees and establishment of good drainage are helpful.—*Oran Raber*.

3903. RAVAS, L. Ce qu'il faut connaître du Mildiou. Règles à suivre pour le combattre. [What is known of mildew. Rules for combatting it.] *Prog. Agric. et Vitic.* 74: 413-422. 1920.

3904. RICHARDSON, A. E. V. Treatment of wheat for smut. Use of powdered copper carbonate and powdered copper sulphate for control of smut. *Jour. Dept. Agric. Victoria* 22: 224-230. 1924.—Powdered copper sulphate gave 10% lower germination than copper carbonate. Both are superior to the liquid treatment for wheat bunt (*Tilletia tritici*).—*Wm. E. Lawrence*.

3905. SHARPLES, A. A collar disease of rubber seedlings. *Malayan Agric. Jour.* 13: 150-153. 1925.—*Diplodia* sp., commonly causing die-back of *Hevea* branches, was found on seedlings suffering from a collar rot. It is not certain whether the fungus is the primary cause of the disease or whether it attacks secondarily when the seedlings are weakened through excessive heating or a water-logged soil.—*R. E. Holtum*.

3906. SNELL, WALTER H., AND ANNIE RATHBUN-GRAVATT. Inoculation of *Pinus strobus* trees with sporidia of *Cronartium ribicola*. *Phytopathology* 15: 584-590. *Fig. 1-2*. 1925. In 1922 at Conway, New Hampshire, 144 branches on 51 trees on *Pinus strobus* L. were inoculated with sporidia of *Cronartium ribicola* and kept in moist chambers 24-36 hours; 53 additional branches on 9 of the same trees were inoculated on rainy mornings and left uncovered. The trees were 5-30 years old. Several trees of *Pinus resinosa* Ait. were also used. Telia were collected on the leaves of *Ribes odoratum*, *R. cynosbati*, and *R. nigrum* and stored in an ice box for at least 12 hours, after which the telia were germinated for several hours in moist chambers. The leaves with the germinated telia were applied to the moistened needles of the pine and held in place by small wires. The whole tree or the lower inoculated branches were then placed in moist chambers. Of the 51 trees inoculated in moist chambers (described), 18 had become diseased, and 20 of the 144 branches had become cankered, in 1924; 6 of the 9 trees inoculated under natural conditions became diseased by 1924. No infection occurred on *P. resinosa*.—*Naomi Chapman*.

3907. SPAULDING, PERLEY. A partial explanation of the relative susceptibility of the white pines to the white pine blister rust (*Cronartium ribicola*, Fischer). *Phytopathology* 15: 591-597. 1925.—Variations in the relative persistence of the leaves and in the distribution of the stomata on different species of *Pinus* are apparently correlated with their susceptibility to *Cronartium ribicola* Fischer. A thick inner bark seemed more favorable to blister rust. It is thought that the greater abundance of phloem favors the fungus. Tables based on observations made by the author in the U. S. A. and in Europe classify the species of white pine as related to the above characters.—*Naomi Chapman*.

3908. SPAULDING, PERLEY, AND ANNIE RATHBUN-GRAVATT. Conditions antecedent to the infection of white pines by *Cronartium Ribicola* in the Northeastern United States. *Phytopathology* 15: 573-583. *Fig. 1-5*. 1925.—The production period for telia of *Cronartium ribicola* varies with weather conditions and time of shedding of leaves in different species of *Ribes*. There is about 2 weeks' difference between the first appearance of telia and the period of greatest abundance. Germination of teliospores is especially dependent upon moisture; lowering of the temperature only checks the rate. The effect of high temperatures have not been tested. Newly matured teliospores germinate within about 6 hours at 75°F. Infection of seedlings of *Pinus strobus* may occur within 12½ hours after the formation of mature sporidia of *C. ribicola*. Increase in age increases the time required for the germination of the teliospores. The longevity of teliospores is influenced by the habitat of the *Ribes* host and the structure of its leaves—both conditions associated with access of moisture. Rain and mist may prevent dissemination of sporidia. Graphs of 5 possible combinations of weather conditions illustrate the chances for infection to take place under each. Further lines of investigation are suggested regarding conditions influencing infection.—*Naomi Chapman*.

3909. TENNENT, R. B. Club-root in turnips. *New Zealand Jour. Agric.* 30: 259-269. 1925.—Tests of varieties at several locations have shown no immune turnips, nor of the data at hand warrant designating any of them as resistant.—*N. J. Giddings*.

3910. THOMAS, K. SIMON. *Onderzoekingen over Rhizoctonia*.—98 p. 10 pl. (Doctors Thesis. Utrecht.) *Phytopath. Willie Com. Scholten: Baarn*, 1925.—A number of isolations of *Rhizoctonia Solani* and related fungi (*Moniliopsis*, *Rhizoctonia* from orchid roots) were tried as to their infection possibilities. Most of them (the symbiotic ones included) infected species from the most different plant families. Although the specialization is small, a certain predilection for the original host-plant is found.—The morphological differences are small, but the author finds 3 groups of *Rhizoctonia Solani* strains, which are characterized by different width of the mycelium and different temperature optima for growth. *Moniliopsis Aderholdii*, *Rhizoctonia microsclerotia* and *R. mucoroides* are not more different from *Rhizoctonia Solani* than are the different strains of *R. solani* among themselves.—*Johanna Westerijk*.

3911. [TRAVERSO, G. B.] Due interessanti micocecidi della Somalia. [Two interesting gall-forming fungi of Somalia.] *Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. Roma*. 1: 102. 1920.—Some of the characters of 2 fungi collected in an expedition by the Duke of Abruzzi into Italian Somalia are given, namely, *Aecidium Schweinfurthii* P. Henn. on *Acacia* sp. (probably *A. Seyal*), and *Uromyces cladomanes* Traverso n. sp., causing witches' broom on *Cissus* sp.—*R. Ciferri* (translated by L. C. Cash).

3912. TRAVERSO, G. B. *Gloeosporiosi del Leccio*. [Gloeosporium disease of the ever-green oak.] Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. Roma. 1: 51, 1920.—This is a preliminary note on a disease of *Quercus ilex* in which the leaves are spotted with brown on the upper surface, the spots being at first isolated, round with a zonate structure, especially abundant along the midrib of the leaf, then confluent, and finally invading a new portion of the leaf. The disease seems especially to attack pruned trees and preferably the rather tender young leaves which become partially deformed. The parasitic agent is a *Gloeosporium*, probably anew species.—*R. Ciferri* (translated by L. C. Cash).

3913. [TRAVERSO, G. B.] *Svernamento della Marsonia Juglandis sui rami del noce*. [Overwintering of *Marsonia Juglandis* on walnut.] Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. Roma. 1: 50-51, 1920.—*Marsonia Juglandis* overwinters on the lower branches and especially on the suckers at the base of the trunk of the walnut tree and reproduces the disease the following spring. In cases of severe infection the leaves which have fallen to the ground should be destroyed. The characters of the disease are briefly given.—*R. Ciferri*.

3914. TRAVERSO, B. G. *Una nuova malattia dell'aglio*. [A new disease of garlic.] Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. 4: 101-102, 1923.—A new disease of *Allium sativum* caused by *Helminthosporium allii* Camp, n. sp. which produces true cankers on the bulbs. The attacked bulblets do not rot but all conserve their turgor. Not all the bulblets of a bulb become diseased. The diseased plants have the skins, floral scapes and leaves blackened. The fungus attacks preferably the larger plants growing in heavily manured soil. The host and the etiological characters of the disease make it of particular interest.—*R. Ciferri*.

3915. TROTTER, A. *Cancrena pedale del peperone e Melanzana nella Campania*. (Cap-sicum annuum e Solanum Melongena.). [Stem blight of pepper and egg plant in Campania.] Rivist. Patol. Veg. 14: 125-130, 1924.—For a number of years a disease of pepper and egg-plant has been found in Campania and especially in the province of Naples. The plants wilt in the daytime and revive at night. The base of the stem is attacked, especially near the crown where it may become contracted and the tissue more or less brown. The cortical portion of the stem was found to be invaded by an abundant, large, branching mycelium, rich in granular plasm and provided with small haustoria. Oogonia and sporangia (conidia) permitted the fungus to be identified as *Phytophthora omnivora*.—*F. M. Blodgett*.

3916. TURCONI, MALUSIO. *Note di patologia vegetale*. [Notes on plant diseases.] Rivist. Patol. Veg. 13: 157-164, 1923.—Under humid conditions *Botrytis cinerea* was found attacking the fruits of *Vanilla planifolia*; and the pycnidial form (*Ascochyta wistariae*) was found, together with immature perithecia, on leaves of *Wistaria chinensis* from Sicily. Mature perithecia were found in 1923 and the fungus is described as *Sphaerella wistariicola* n. sp. *Pleospora infectoria* and its conidial stage (*Alternaria tenuis*) were found on leaves of the same host. A pycnidial form of another fungus on this host is described as *Hendersonia septorioides*. n. sp.—*F. M. Blodgett*.

3917. VILLEDIEU, MME., ET G. VILLEDIEU. *De la non-toxicité du cuivre pour les mois-sures en général et pour le mildiou en particulier*. [The non-toxicity of copper for molds in general and mildew in particular.] Prog. Agric. et Vitic. 75: 498-500, 1920.—By the use of copper in the form of cupr-ammonium citrate and cupric citrate, the authors claim to have shown copper to be non-toxic. They attribute toxicity of CuSO_4 to free H_2SO_4 , and of CuO to OH .—*E. L. Proebsting*.

3918. WESTERDIJK, JOHANNA, EN A. VAN LUIJK. *Eine Anthraknose des Kümmels*. (Carum caroi.) Mededeel. Phytopath. Lab. Willie Com. Scholten 8: —, 1925.—A new disease of the caraway due to a new species, *Cercosporu Cari*, causes anthracnose of the stem and patches on the leaves. Cultures of the fungus in oatmeal agar, formation of chlamydo-spores, and infection experiments are discussed.—*Johanna Westerdijk*.

3919. WESTERDIJK, JOHANNA, EN A. VAN LUIJK. *Über einige Gefasskrankheiten*. [A vascular disease.] Mededeel. Phytopath. Lab. Willie Com. Scholten 8: pp. ? 1925.—A wilt disease of *Rhus* sp. caused by *Verticillium Albo-atrum* and a description of the fungus of the wilt disease of the Michalmas daisy (aster). Next to the *Cephalosporium* conidia described by Dowson, the authors find *Verticillium* conidia and consider the fungus identical with *Acrostalagmus Vilmorini* Cjue.—*Johanna Westerdijk*.

DISEASES CAUSED BY BACTERIA

3920. KOTILA, J. E., AND G. H. COONS. Investigations on the black-leg disease of potato. Michigan Agric. Exp. Sta. Tech. Bull. 67. 1-29. Pl. 1-7. 1925.—Blackleg occurs frequently in Michigan, destroying both tops and tubers. Tubers decay from the stem end, from infection through the stolon. In some fields in the Upper Peninsula 25-75% loss was observed in 1915. The causal organism from many parts of Michigan proved to be culturally the same as *Bacillus atrosepticus* van Hall from the Wisconsin and the Maine Experiment Stations. Of 8 varieties of potatoes tested for susceptibility, Bliss Triumph and Green Mountain were most resistant to tuber decay, but most susceptible to injury to the growing plants; the most resistant for the latter, Sir Walter Raleigh and Carmen No. 3, were, on the other hand, most susceptible to tuber decay. Positive infections were obtained on tomato and *Nicotiana rustica*, but not on garden petunia, wonderberry (*Solanum nigrum* var.), *Solanum dulcamara*, *Datura stramonium*, *Nicotiana tabacum*, and *Physalis* sp. The amount of inoculum had a great effect on the occurrence of decay in tuber slices as shown by tests which are detailed. An enzymic extract from rotted tuber slices, placed on potato and carrot slices, caused marked softening in potato after 48 hours, and in carrot after 72 hours, due to solution of the middle lamella. The tuber slices were not discolored as in the bacterial decay. When the cut end of a potato stem surrounded by a sterile collodion sack is placed in a broth culture of *Bacillus atrosepticus* the toxic substances secreted by the latter penetrate through the collodion and cause the leaves to wilt, although neither the enzyme nor the bacteria have penetrated the collodion. When dried on a cover glass the organism dies in less than 1 day; on silk thread, in less than 5 days. A field of potatoes at Catham (in the Upper Peninsula) was left unharvested and the next spring the tubers were dug. On account of the deep snow the soil had not frozen. These tubers were sorted and those without signs of decay were treated part with $HgCl_2$, part with formaldehyde and part left untreated. On planting they showed respectively 0.4, 1.4 and 7.2% of blackleg plants. Soil mixed with blackleg-rotted tubers was left over winter and in spring small amounts of this soil were placed on tuber slices. A high proportion rotted but the blackleg organism could not be isolated from any of them. Further experiments showed that infection does not take place from the organism in the soil, from diseased hills to healthy hills through the soil, nor from diseased plants to healthy tubers planted after removing the diseased plants. It was shown, however, that the causal organism may be present in the soil for several days. A lytic principle was isolated from soil and from rotted carrots, which had the power of destroying *Bacillus atrosepticus* in culture and which also prevented infection when the organism and the lytic principle were inoculated simultaneously into raw tuber slices.—*Ernst A. Bessey.*

3921. RAPP, C. W. Bacterial blight of beans. Oklahoma Agric. Exp. Sta. Bull. 131. 1-39. Fig. 1-16. 1920.

3922. REDDICK, DONALD, AND V. B. STEWART. Crown-gall of apple and peach with notes on the biology of *Bacterium tumefaciens*. New York [Cornell] Agric. Exp. Sta. Mem. 73. 1-19. 2 pl., 4 fig. 1924.—Thirty-six apple trees and 98 peach trees bearing crown-galls (*Bacterium tumefaciens*) were planted (1912), at Ithaca, New York, and removed in 1919 or earlier. The galls had largely disappeared and there was no indication of interference with tree growth. Crown-gall of apple and peach in New York is thought to be a disease of concern primarily to the nurseryman.—*Bacterium tumefaciens* remained alive in sterilized quartz, loam, and clay soil from November 1914 to April 1915 when exposed to out-of-door fluctuations of temperature. It also remained alive in tubes of dry, sterilized quartz, loam and clay for 30 days and in similar tubes with plenty of moisture it was alive after 13 months. *Bact. tumefaciens* was washed through tubes of quartz and of loam 60 cm. in length.—*D. Reddick.*

3923. REIMER, F. C. Blight resistance in pears and characteristics of pear species and stocks. Oregon Agric. Exp. Sta. Bull. 214. 1-99. Fig. 1-35. 1925.—A comprehensive account of studies on control of fire blight at the Southern Oregon Experiment Station. During the past 12 years this Station has assembled practically all the known species of *Pyrus* and many of the varieties from which cultivated types have been developed, including native species from Europe, North Africa, Asia Minor and Asia, obtained partly through exploration trips by the author into China, Manchuria, Korea and Japan. The 2 most promising from the

standpoint of blight resistance are *Pyrus calleryana* and *P. ussuriensis*, both natives of China; the fruits, especially of *P. calleryana*, are of no commercial importance but the species are valuable for propagation of blight-resistant pear stock. *P. calleryana* is the most suitable species for rootstocks where root-blight is prevalent and the winter climate is mild as in the Rogue River Valley of Southern Oregon. In colder regions certain cultivated varieties of *P. ussuriensis* make good rootstocks where root-blight is prevalent. For trunk and framework stock, Old Home, a highly resistant variety of *P. communis*, is recommended. The 1-year-old trees built up in this way are planted in the orchard and grown for 3 years or more and then top-worked with the desired commercial variety.—*C. E. Owens.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

3924. ANONYMOUS. A disease affecting lucerne. Agric. Gaz. New South Wales 36: 827. 1925.—The eelworm disease of alfalfa (*Tylenchus dipsaci*) is reported from New South Wales for the 1st time, although indications are that it has been present for a number of years.—*L. R. Waldron.*

3925. BEQUAERT, J. Neotermes injurious to living guava tree [*Psidium guayava*], with notes on other Amazonian termites. Entomol. News 36: 289-294. 1 pl., 1 fig. 1925.

3926. CHRYSTAL, R. N. The genus *Dreyfusia* (order Hemiptera, family Chermesidae) in Britain, and its relation to the silver fir. Phil. Trans. Roy. Soc. London B. 214: 29-61. 5 pl., 10 fig. 1925.—The life-histories of *Dreyfusia nüsslini* Börner and of *D. piceae* (Ratz) Börner were studied at Kew, and are here discussed. *D. nüsslini* feeds on the stems of silver fir (*Abies pectinata*) and produce malformations which from the bud onwards cause the xylem to be much suppressed in the stem and leaf trace bundles. The stylet penetrates between the cells, which when affected become abnormally large with thickened walls. The enlargement restricts the passage of water and the functioning of the cambium. In time the plants die. *D. nüsslini* can also attack *Abies grandis* but does not spread there as much as on *A. pectinata* and *A. nordmannia*; it settles principally at the bases of needles and on buds. The latter swell and become distorted, due to enlargement of the cortical cells and increased growth of phloem.—*W. R. G. Atkins.*

3927. COAD, B. R., E. JOHNSON, AND G. L. McNEIL. Dusting cotton from airplanes. U. S. Dept. Agric. Bull. 1204. 1-40. Fig. 1-19. 1924.—In this detailed report of experiments the authors describe types of specially constructed hoppers tested for carrying poison dust; mechanism for controlling poundage per acre of dust discharge; behavior of the dust in the air as influenced by various air conditions; adhesion of dust to the plants; flying methods used; tests of various insecticides; economics of airplane dusting; characteristics of airplanes used and cost of operation, with suggestions for further investigations.—Results showed that poison dust can be blown among the cotton plants from the air above them and that this dust can be made to adhere to the plants under day-time conditions when plane operation is feasible and that the planes can be manipulated so that all portions of the fields can be treated. Pronounced economy as compared with ground machinery is shown to be possible in airplane use and that it has the advantage of centralizing control of the operation and of placing it on a more skilled basis, tending greatly to increase the quality of results secured.—*B. R. Coad.*

3928. FABRICIUS. [Rev. of: APPEL, O., PAUL GRÄBNER, UND L. REH. Handbuch der Pflanzenkrankheiten. 4 Bd. Tierische Schädlinge an Nutzpflanzen. Erster Teil. (Handbook of plant diseases. Vol. 4. Animal pests. Part 1.) 483 p. 218 fig. Paul Parey: Berlin, 1925.] Forstwiss. Centralbl. 47: 834-836. 1925.

3929. GATER, B. A. R. Some observations on the Malayan coconut Zygaenid (*Artona catoxantha* Hamps.). Malayan Agric. Jour. 13: 92-115. 1925.—In connection with the general biology of this moth, which may be a serious pest of coconut palms, reference is made to the fungus, *Botrytis necans*, which is parasitic on the larvae and has been used for control. Laboratory inoculations with the fungus have given negative results.—*R. E. Holttum.*

3930. GIRAULT, A. A. Report upon an investigation of banana rust. Queensland Agric. Jour. 23: 473-517. Pl. 87. 1925.—*Anaphothrips signipennis* occurs in the North Coast Line District of Queensland at Gympie and feeds upon the pseudostem and fruit of the banana,

producing a powdery blotching of the fruit skin which turns leathery and becomes more or less cracked. Regular powdering of the fruit with a bulb-blower using pyrethrum powder and wood ashes in equal proportions is recommended. Details of the life history of the insect are given.—*W. D. Francis.*

3931. HERRICK, GLENN W. *Manual of injurious insects.* xxi + 489 p. *Illus.* H. Holt & Co.: New York [1925].

3932. HERRICK, GLENN W. *Notes on some little known thrips (Thysanoptera).* *Entomol. News* 36: 180-183. 1925.—Galls or injury to *Lilium*, *Cornus* and *Veratrum* are mentioned.—*O. A. Stevens.*

3933. KOTILA, J. E. *Leafhopper injury to potatoes.* *Michigan Agric. Exp. Sta. Tech. Bull.* 56. 1-27. *Fig. 1-13.* 1922.—In Michigan it has been demonstrated that the so-called "tipburn" of potato foliage is due to leafhopper injury. In some years the crop loss in the state is 25% or approximately 10,000,000 bushels. The relation of the leafhopper (*Empoasca mali* Le B.) to this disease, first demonstrated by E. D. Ball, was confirmed by extensive caging experiments in the greenhouse and in the field, which are described in detail. The life history of the insect is described and illustrated. In Michigan the insect apparently overwinters in trash in the adult stage. The migration to the potato occurs usually about the middle of June. A generation requires about 1 month. In Michigan there are 2 full generations and usually a partial 3rd. Greatest damage is done toward the end of July and in August, by the 2nd generation. Late-planted potatoes usually showed the least injury not being far enough advanced at the spring migration. When June, following a normal spring, is warmer and drier than usual, severe leafhopper injury may be expected. Early varieties are more susceptible than late varieties; the Rural types are most resistant. Bordeaux mixture as a repellent applied at the right dates gives good control. Dusts are still in the experimental stage. Many weeds are hosts for this leafhopper, and must be eradicated.—*Ernst A. Bessey.*

3934. KOTILA, J. E. *Spraying for hopperburn.* *Michigan Agric. Exp. Sta. Circ.* 48. 1-3. 1 *fig.* 1922.

3935. KÜSTER, ERNST. *Cecidologische Notizen III.* [Cecidological Notes. III.] *Flora* 118-119: 339-345. 2 *fig.* 1925.—Comparisons are made between galls cultivated in moist chambers and those matured in the open, with special reference to the development of hairs on the leaves in galls produced by *Eriophyes tilae* on *Tilia* and by *Cephaloneon myrideum* on *Acer*.—*A. G. Stoekey.*

3936. MARCHAL, P. *Les traitements arsenicaux et mixtes des arbres fruitiers.* [Treatment of fruit trees with arsenicals.] *Prog. Agric. et Vitic.* 75: 517-523, 539-546. 1920.—The author discusses efficacy, time of application, choice of compound, quantity, method of application, results to be expected, and effects on the insects and on the plants.—*E. L. Proebsting.*

3937. TRAVERSO, G. B. *Irrorazioni dachicide e fumaggine degli olivi.* [Spraying for olive fruit-fly, and the development of *Fumago* of the olive.] *Boll. Mens. Inform. Notiz. R. Staz. Patol. Veg. Roma* 2: 34. 1921.—In this preliminary note the author concludes that spraying to control the olive-fly does not affect *Fumago*.—*R. Ciferri (translated by L. C. Cash).*

3938. WEISS, HARRY B., AND ERDMAN WEST. *An adelid gall on Virginia creeper (Lepidoptera).* *Entomol. News* 36: 116-118. 1 *fig.* 1925.—Enlarged petioles of *Ampelopsis quinquefolia* due to the larvae of this moth are described and figured from New Jersey.—*O. A. Stevens.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

3939. DICKSON, B. T. *Tobacco and tomato mosaic.* *Science* 62: 398. 1925.—The expressed juice of mosaic-diseased tobacco plants has been proved to retain its power to infect when kept sealed in a bottle for 5 years. The "streak or stripe" disease of tomato results from a double inoculation with the virus of potato and tomato mosaics.—*C. J. Lyon.*

3940. NELSON, RAY. *The occurrence of protozoa in plants affected with mosaic and related diseases.* *Michigan Agric. Exp. Sta. Tech. Bull.* 58. 1-28. *Fig. 1-18.* 1922.—The author found in the phloem of plants of bean affected with mosaic, but not in healthy plants, certain short to long, ellipsoid, or slender, spindle-formed bodies with an apparent flagellum at each pole. These apparent protozoa were often in close proximity to the sieve tube nucleus. Proper destaining permits a body interpreted as a nucleus to be observed, as well as a blepharo-

plast. In some of the chloroplasts of the leaves are found numerous spindle-shaped bodies, perhaps another stage of this organism. In very thin longitudinal sections of living bean petiole these organisms were seen in the sieve tubes in active motion. Expressed juice observed with the dark-field condenser showed these bodies flashing into and out of view. Similar organisms were found in stained tissues of mosaic red clover plants. In tomato plants affected with mosaic the bodies found in the sieve tubes were more or less spirally twisted and resembled the genus *Trypanosoma*. The smaller, more slender individuals sometimes resembled a Spirochaete. On some of the larger individuals what appeared to be an undulatory membrane was present. Very similar bodies were found in the sieve tubes of leaf-rolling potato plants. In both tomato and potato, as in the bean, the organisms seem to occur frequently in contact with the cell nucleus which may often show symptoms of injury.—*Ernst A. Bessey*.

3941. OLITSKY, PETER K. The transfer of tobacco and tomato mosaic disease by the *Pseudococcus citri* [in greenhouses]. *Science* 62: 442. 1925.

3942. PANTANELLI, E. Sulla causa del mosaico nelle piante. [The cause of mosaic.] *Boll. Mens. Inform. e Notiz. R. Staz. Patol. Veg.* 1: 40-41. 1920.—A plant of *Hypochaeris radicata* punctured by the aphid *Macrosiphon tussilaginis* presents symptoms of mosaic in the attacked plants, developing yellow spots corresponding to the puncture. The other leaves are healthy and moreover developed in the absence of aphids. This, combined with the results obtained by others and by the author on the grape with *Drepanothrips reuteri* and *Phyllocoptes* have led him to believe that mosaic is caused by the puncture of the insects during the first stage of development of the leaf or by microscopic species, as the Eriophyidae, or those which disappear quickly as, thrips or Homoptera.—*R. Ciferri (translated by L. C. Cash)*.

3943. SALAMAN, REDCLIFFE N. Degeneration of the potato—An urgent problem. *Jour. Nation. Inst. Agric. Bot.* 3: 39-51. 1925.—The author briefly reviews the history and present status of this group of potato diseases, states that their spread is increasing, and appeals to the Ministry to found a Research Institute in such adequate manner as will allow a study of the problem worthy of its importance.—*Frederick V. Rand*.

3944. SCHULTZ, E. S. A potato necrosis resulting from cross-inoculation between apparently healthy potato plants. *Science* 62: 571-572. 1925.

PARASITIC PHANEROGAMS

3945. WAGENER, WILLIS W. Mistletoe in the lower bole of incense cedar. *Phytopathology* 15: 614-616. 1925.—Irregular fusiform or barrel-shaped swellings often found on the upper parts of the bole of incense cedars are caused by *Phoradendron libocedri*. An unusually large swelling on the lower bole of a tree was determined to be at least 409 years old. Infection had apparently taken place when the tree was much younger than is the general rule.—*Naomi Chapman*.

NON-PARASITIC DISEASES

3946. BAKER, C. E. Storage scald in barreled apples. *Amer. Fruit Grower* 45¹¹: 8, 25. *Illus.* 1925.—The author discusses the use of oiled paper wraps in boxed apples and shows that this is a valued method for control of storage scald. Wrapping of barreled apples is considered impractical but shredded oiled paper is said to give gratifying results.—*Arthur S. Rhoads*.

3947. BERNARD, CH. Wind- en vorst-schade. [Wind and frost injury.] *Thee* 6: 14-17. *Illus.* 1925.—In nearly all the tea plantations in Java more or less breakage occurs by wind, particularly near the coast, and near mountain passes. Injured plants are attacked by red rust and develop a long enduring broom habit which prevents yield. Wilting of the large leaves is held due to their constant motion in the wind. The author recommends planting windbreaks in the form of interplanting with legumes which also furnish shade and enrich the soil.—Frost injures only a few of the plantations at the highest elevations. Smoke clouds are useless for tea. Leguminous shade trees, pruned to keep them low and dense, have been tried with advantage against frost. Drains 2-3 m. deep have also proved useful.—*Carl Hartley*.

3948. GARRETSEN, A. J. *Enkele aantekeningen over forstschade en Acacia decurrens*. [Notes on frost injury in *Acacia decurrens*.] Thee 6: 17-19. *Illus.* 1925.—Frost injury is frequent on the Pengalengan Plateau, sometimes killing entire young plantations. *Acacia decurrens* is adapted to the situation and when properly pruned and accompanied by drains 1 foot wide and 1.8 m. deep at every 2nd or 3rd row, gives good results in decreasing the damage. The proper method of pruning *Acacia* is described. Its wood is exceptionally good for fuel and for mine timber. It is planted on a large scale in South Africa because of its yield of tannin.—*Carl Hartley*.

3949. GAUCH, A., ET J. DURAND. *Quelques considérations sur la nature de la maladie du court-noué*. [The disease, "short-node."] Prog. Agric. et Vitic. 74: 540-543. 1920.—This disease of the grape is considered a nutritional disturbance due to lack of a growth promoting substance under normal conditions supplied by soil bacteria. (See also this issue, Entry 3951.)—*E. L. Proebsting*.

3950. LAMBE, G. *Vortschade op Kertasari*. [Frost injury at Kertasari.] Thee 6: 57-58. 1925.—At this plantation a temperature minimum of 2.5°C caused injury of over 500 acres of tea. Frost drains proved very beneficial, low places thus provided suffering less than undrained slopes and hills.—*Carl Hartley*.

3951. LEFÈVRE, CH. *Le court-noué et les vitamines*. ["Short-node" and vitamins.] Prog. Agric. et Vitic. 74: 587-588. 1920.—A reply to Gauch and Durand. (See this issue, Entry 3949.)—*L. Proebsting*.

3952. RAVAS, L. *La thylose*. [Tylosis.] Prog. Agric. et Vitic. 74: 254-256. 1 pl. 1920.—A premature drying and taking on of autumnal characteristics by some American grape vines and their hybrids, in extreme cases resulting in the death of the vine, is attributed to the formation of tyloses in the vessels.—*E. L. Proebsting*.

3953. RAVAS, L. *Traitement of chlorose*. [Treatment of chlorosis.] Prog. Agric. et Vitic. 75: 437-439. 1920.

DISEASES OF UNKNOWN CAUSE

3954. BERNARD, CH. *Het een en ander over Vigna enz.* [Notes on *Vigna*.] Thee 4: 43-44. 1923.—Harmful beetles were found in Sumatra (East Coast) parasitized by *Sporotrichum globuliferum*. A wilt of unknown origin is reported which causes the death of the parts of the plants above the ground; on the advent of drier weather the plants recover.—*Carl Hartley*.

3955. CARNE, W. M. *Cracking and russetting of Dunn's and other apples*. Jour. Dept. Agric. Western Australia 2nd ser. 2: 214. 1925.—Results of spraying experiments conducted by growers relative to cracking of Dunn's and other apples indicate that the suspected fungus (*Coniothecium* sp.) is purely secondary. Cracking is most serious on light bearing, poorly growing trees.—*P. J. Olson*.

3956. [RHODES, ARTHUR S.] *Citrus blight investigations*. Ann. Rept. Florida Agric. Exp. Sta. 1924: 91R-94R. 1925.—This is a progress report of the author's investigations of citrus blight, wilt or leafcurl. It occurs most abundantly on the lighter, drier types of soils, especially where underlaid by coquina rock, and least abundantly on low hammock soils. Blight was also found on practically all varieties regardless of rootstock. The roots in general were either strikingly deficient or virtually lacking in fibrous feeding roots and in some cases the wood of the large lateral roots appeared as though partially seasoned. No evidence was found of decay or discoloration in the wood of dead or dying branches on blighted trees; nor was there any indication of an organism that might be regarded as the cause. Extensive experiments using budwood from affected branches gave, so far as the buds and grafts were successful, a perfectly healthy growth.—*Author*.

3957. RHODES, ARTHUR S. *Observations on citrus wilt*. Proc. Florida State Hort. Soc. 1925: 26-39. 1925.—The early history and economic importance of citrus wilt are briefly discussed and a detailed description is given of the trouble. The great range of variation in the susceptibility of citrus trees to wilt on the different soil types demonstrates a very clean-cut relation with the water-holding capacity of the soil. Investigations show that the moisture content of the soil frequently become inadequate to maintain citrus trees. Citrus trees of all

ages have also been observed to develop a chronic wilt and decline following periods of prolonged saturation of the soil. The wilting resulting from even relatively slight cases of water injury may be greatly accentuated by the subsequent drying out of the soil. The evidence available indicates that the wilt exhibited by these 2 types is attributable to the same cause, drought, which operates directly in one case and indirectly in the other. The author regards this trouble as purely physiological, and caused primarily by irregularities of soil moisture conditions, chiefly from a deficiency in the amount of soil moisture available during the dry season of the year. General cultural recommendations are given.—*Author*.

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

3958. ANONYMOUS. **American Phytopathological Society.** *Phytopathology* 15: 618-649. 1925.—The constitution and a list of the patrons and members of the American Phytopathological Society are given.—*Naomi Chapman*.

3959. BALLARD, E. **Damage done to cotton seed by plant bugs.** *Queensland Agric. Jour.* 24: 203-206. *Pl.* 52-53. 1925.—Cotton seed is pierced by the following insects: *Tectacoria lincola*, *Dysdercus sidae* and *Oxycaraenus lactuossis*. Seed so punctured is frequently damaged by the action of a fungus and 3-4 bacterial species, and is frequently rendered incapable of germination.—*W. D. Francis*.

3960. BALLARD, E. **Some of the causes of low-grade cotton.** *Queensland Agric. Jour.* 23: 542-545. *Pl.* 95-96. 1925.—Brown, yellow and black stains of cotton are caused by the action of *Fusarium moniliforme* which enters when the boll is injured by *Heleothis obsoleta*, *Dichocrocis punctiferalis*, *Earias hugelli*, *Platyedra gossypiella*, and *Eucosma plebiana*.—*W. D. Francis*.

3961. BATEMAN, ERNEST, AND CARLETON HENNINGSEN. **A theory on the mechanism of the protection of wood by preservatives. Part V: Further work on hydrocarbons.** *Proc. Amer. Wood Preservers' Assoc.* 20: 33-37. 1924.—It is suggested that it is unlikely that paraffin hydrocarbons can be used as the toxic agent in wood preservatives, that naphthalene may be of some commercial value, and that the addition of some toxic material is required for refined petroleum products.—*Walter H. Snell*.

3962. BATEMAN, E., AND C. HENNINGSEN. **A theory on the mechanism of the protection of wood by preservatives. Part VI—Toxic principles of creosote.** *Proc. Amer. Wood Preservers' Assoc.* 21: 22-26. 1925.—A summary of previous work is given, the conclusions thus far being that the essentially toxic materials in coal tar creosote are the hydrocarbon oils boiling below 270°C. and the tar acids and bases boiling above 270°C.; hydrocarbon oils boiling below 270°C. are so much more toxic than any other class of material as to be considered the essential toxic materials of ordinary creosote; and that the high boiling tar acids and bases are the essential toxic materials of the high boiling distillates. (See also this issue, Entry 3969.)—*Walter H. Snell*.

3963. BERNARD, CH. **Kankergetzwellen op den theestam.** [Cancer swellings on tea trunks.] *Thee* 6: 40-42. *Illus.* 1925.—Large galls at the crown have been repeatedly found in tea, affected plants being decreased in vigor. Like the root crown disease (*Ustilina maxima*), they result from knife wounds made during cultivation. Bark, rays, and woody tissues are all involved in the hypertrophy, and the wood becomes abnormally hard. *Pseudomonas tumefaciens* is suspected as the cause, *Ustilina* and other root fungi and bacteria entering as secondaries often causing decay or death. *Dematea* sp. and *Ganoderma pseudoferreum* (*Poria hypolateritia*) are named among the secondaries. Galls below the soil surface are in the main similar. The occurrence of the disease is sporadic and no great damage is reported.—*Carl Hartley*.

3964. BISBY, G. R. **Potato diseases [in Manitoba].** *Proc. Western Canadian Soc. Agron.* 3: 59-60. 1922.

3965. COTTRELL-DORMER, W. **Cane diseases and pests.** *Queensland Agric. Jour.* 23: 271-272, 389-393. 1925.

3966. GATES, R. R. [Rev. of: KÜSTER, ERNST. *Pathologische Pflanzenanatomie.* (Pathological plant anatomy.) 3d. ed. xii + 558 p. Gustav Fischer: Jena, 1925.] *Nature* 116: 460-461. 1925.

3967. GENTNER, G. *Die Feststellung von Pflanzenkrankheiten, die vom Saatgut ausgehen.* [The determination of plant diseases transmitted by seed.] Rept. 4th Internat. Seed Testing Congress 1924: 113-114. 1925.—In addition to making a purity analysis and viability test of a sample of seed stock it is very important to determine the presence or absence of seed-borne plant parasites. This can often be done during the purity analysis, the fungi being often readily detected in one or more of its forms, or in the germination bed where a definite procedure (Hiltner's method) as outlined by the author is applicable. Following a discussion of the methods employed by the author in Munich, certain bacteria and 17 groups of fungi found upon the seed of an extensive list of plants, are enumerated.—*M. T. Munn.*

3968. KOTILA, J. E., AND G. H. COONS. *Potato spraying and dusting experiments in Michigan.* Michigan Agric. Exp. Sta. Tech. Bull. 72. 1-15. Pl. 1-2, fig. 1. 1925.—Because of the ease of application dusts have a great advantage over sprays. To test their comparative value for control of potato diseases, extensive experiments were conducted at Chatham, Upper Peninsula, in 1922, 1923, and 1924. The last 2 seasons were abnormally free from fungous and insect troubles. In both seasons the gains or losses in yield for the different treatments as compared with the yields of the check rows were of the same order as or even much less than the probable error; no stimulative effect of Bordeaux mixture was noted. In 1922 potato leafhopper burn was very prevalent. The check plots yielded at a rate per acre of 153.2 ± 3 bushels; the plots sprayed with Bordeaux mixture, 6 applications, yielded at a rate of 229.7 ± 8.03 bushels. Copper sulphate-lime dust, 6 applications, also gave a gain in yield, but the much greater cost made the final result a loss.—*Ernst A. Bessey.*

3969. LARKIN, A. E. [A criticism of Bateman and Henningsen's "A theory on the mechanism of the protection of wood by preservatives." Part VI.—Toxic principles of creosote.] Proc. Amer. Wood Preservers Assoc. 21: 29-37. 1925.—The tests quoted are said to be impractical. The volatile and soluble compounds of high toxicity by Petri dish tests are of no avail in wood exposed to the weather; it is the non-volatile and non-soluble residues which keep air and water out of the wood and supply material sufficiently toxic. Much is quoted to demonstrate the uselessness of tar acids in wood exposed to the weather. (See also this issue, Entry 3962.)—*Walter H. Snell.*

3970. MALENCOVIC, B. *Preservation of timber by fluorine salts and organic compounds.* Proc. Amer. Wood Preservers' Assoc. 19: 469-474. 1923.—The paper gives the history of the author's ideas and experiments with these compounds. It discusses the properties of dinitrophenol and sodium fluoride, the antiseptic properties of a mixture of the 2, and automatic regulation of the impregnation solution.—*Walter H. Snell.*

3971. MOLL, FREDERICK. *Modern processes of wood preservation, using mixtures of sodium fluoride and organic compounds.* Proc. Amer. Wood Preservers' Assoc. 19: 466-468. 1923.—The history of preservation with sodium fluoride and organic compounds is given; also records of the use of dinitrophenol in Europe. It is stated that pine poles treated with this combination will last 16 years as against 5 years for untreated poles, and that treated pine mine props will last 7 years as against 1.—*Walter H. Snell.*

3972. MORSTATT, H. *Entartung, Altersachwäche und Abbau bei Kulturpflanzen insbesondere der Kartoffel.* [Degeneration, senility and deterioration of crop plants, especially of the potato.] Naturw. u. Landw. Abhandl. u. Vorträge 7: 1-74. E. P. Dotterer & Cie: Freising-München, 1925.—In the 1st section the author discusses degeneration and explains that what is commonly called degeneration is simply a pathological condition induced by disease or by injuries occasioned through the influence of environmental factors, and not a deviation of the species from the norm.—In the 2nd part the senility theory is presented and refuted. The deterioration is ascribed to unfavorable influences of climate, soil, cultural methods, and diseases. The author asserts that "dying out" does not occur but that cultivation of the plant ceases because of changed demands for the plant or the production of new and more profitable varieties.—The 3rd section deals with "ecological deterioration," a result of changes in the habitat. He includes here the cases of so-called degeneration and senility discussed in the preceding sections.—In the 4th section examples are cited of so-called degeneration, occurring in the case of fruit trees, vegetables, tobacco and other annual plants, forest trees and tropical commercial plants.—In the final section deterioration of potato varie-

ties is discussed in detail, with a review of the literature and a consideration of the factors involved. An effort is made to distinguish clearly between deterioration and disease.—*P. D. Strausbaugh.*

3973. PEETS, E. *Practical tree repair. The physical repair of trees. Bracing and the treatment of wounds and cavities.* Revised Ed. 270 p. 19 pl. 50 fig. R. M. McBride & Co.: New York, 1925.

3974. RITCHEY, G. E. *The control of plant diseases and insects.* Univ. Nanking, Agric. and Forest. Ser. 14: 1-20. 1921.—This bulletin describes the most common methods, fungicides and insecticides used in western countries for the control of insects and diseases.—*R. H. Porter.*

3975. SOUTH AFRICAN SUGAR ASSOCIATION. *Proceedings of the third Annual Congress held on March 25th, 26th and 27th, 1925, at Umbogintwini, Mount Edgecombe and Durban.* 72 p. Pub. by the Assoc.: Durban, Natal, [1925].—Besides discussion of addresses, field meetings, etc., the following papers of interest to botanists are included: WILLIAMS, C. O. The purchasing of fertilizers.—RAPSON, C. J. Control of streak disease in Uba cane.—STOREY, H. H. The year's progress in cane disease investigations.—CAMPBELL, W. A. Why we adopted the carbonatation process.—EDELMAN, C. The practice and principles of green manuring.—DODDS, H. H. Green manuring for sugar cane.—*Frederick V. Rand.*

3976. TRAVERSO, G. B. *La conferenza internazionale di fitopatologia.* [The international conference of phytopathology.] *Rivist. Patol. Veg.* 14: 1-5. 1924.

3977. YOTHERS, W. W., AND J. R. WINSTON. *Mixing emulsified mineral lubricating oils with deep well waters and lime sulphur solutions.* U. S. Dept. Agric. Dept. Bull. 1217. 1-5. 1924.—(See Bot. Absts. 14, Entry 7414.)

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HEBER W. YOUNGKEN, *Editor*
E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 3075, 3076, 3098, 3110, 3124, 3140, 3377, 3615, 3734, 3948, 4112)

3978. ANONYMOUS. *Poisonous plants of Missouri.* Missouri Bot. Gard. Bull. 13: 132-137. 1925.—A list of 58 species, with notes concerning their poisonous properties.—*O. T. Wilson.*

3979. ADAN, J. W. *About curry.* Pharm. Jour. 115: 350-352, 366. 1925.—In India the making and serving of curry are solemn and elaborate proceedings. The curry stuff is compounded fresh every morning; one kind is composed of cardamoms, coriander seed, black and cayenne pepper, cumin seed, pale turmeric, cloves, cinnamon, and fenugreek; another and highly approved curry-powder is made of cayenne, mustard, fenugreek, allspice, turmeric, salt, cinnamon and green ginger. A well known formula with the Hindustani equivalents is also given.—*E. N. Gathercoal.*

3980. BARNES, M. E. *A survey of the turpentine industry for possible larvicidal substances.* American Jour. Hygiene 5: 309-314. 1925.—The following raw materials, products and by-products of the turpentine industry were studied in reference to their toxic effects upon mosquito larvae: Crude gum as collected from turpentine trees, sawdust from turpentine pine, turpentine oil distilled from gum, low wine, dross, rosin and pine oil.—Larvicidal properties in sufficient strength to merit further investigation were found only in turpentine and in pine oil. It was found that fresh turpentine oil was without effect upon larvae, whereas after standing for 4-5 weeks, it was quite toxic, killing in 2-6 minutes. Barnes cautions that turpentine oil is too expensive to be employed in anti-mosquito work and therefore recommends the use of pine oil.—*Bruce Mayne (Pub. Health Eng. Absts.).*

3981. BENNETT, C. T. *The international standardization of Cinchona bark and its preparations.* Yearbook British Pharm. Conference 1923: 678-692. 1924.—(See Bot. Absts. 13, Entry 2882.)

3982. BRAUN, K. *Pflanzen aus Deutsch-Ostafrika, ihre Namen und Verwendung bei den Eingeborenen.* [Plants of German East-Africa, their names, and the uses to which they are

put by the natives.] Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. 1925: 123-138. 1925.—The following plants are named together with the uses, both economic and medicinal to which they are put by the natives, the latter being tabulated according to localities. Native names are also given. The plants listed are: *Acanthus arboreus*, *Adhatoda Engleriana*, *Anacardium occidentale*, *Baissa viridiflora*, *Barleria* sp., *B. amaniensis*, *B. cephalophora*, *B. mucronata*, *B. opaca*, *B. Prionitis*, *B. Sthulmannii*, *B. ukamensis*, *B. ventricosa*, *Calophanes radicans*, *Carpobolia alba*, *C. Goetzei*, *Cephalosphaera usambarensis*, *Chasalia Buchwaldii*, *C. lacuum*, *C. umbraticola*, *C. violacea*, *Diplorrhynchus mossambicensis*, *Dodonaea viscosa*, *Dyschoriste kilimandscharica*, *Faurea arborea*, *F. speciosa*, *F. discolor*, *F. spinosa*, *F. usambarensis*, *Heeria insignis*, *H. mucronata*, *H. pulcherima*, *Heinsenia diervilleoides*, *Heinsia parviflora*, *H. pulchella*, *Hypoestes verticillaris*, *Isoglossa candelabrium*, *I. lactea*, *Justicia Ansellina*, *J. calcarata*, *J. diclipteroides*, *J. Engleriana*, *J. enosmia*, *J. Fischeri*, *J. flava*, *J. Goetzei*, *J. matammensis*, *J. melampyrum*, *J. rostellaria*, *J. uncinulata*, *Lannea amaniensis*, *L. Barteri*, *L. Schimperii*, *Morinda asterocarpa*, *Polygala amaniensis*, *P. aphrodisiaca*, *P. Goetzi*, *P. Gomesiana*, *P. maxima*, *P. ruderalis*, *P. senensis*, *P. usambarensis*, *Protea abyssynica*, *P. kilimandscharica*, *P. linearifolia*, *P. rubrobracteata*, *Rauwolfia* sp., *R. inebrians*, *R. mombasiana*, *R. obliquinervis*, *R. oreogiton*, *R. rosea*, *Sclerochiton* sp., *Thunbergia alata*, *T. argentea*, *Trianthema pentandrum*. (See also Bot. Absts. 14, Entry 8025.)—*Elmer H. Wirth.*

3983. BROcq-ROUSSEU, ET P. BRUERE. Accidents mortels sur des cheveux dus a la graine de *Cassia occidentalis* L. [Fatal poisoning of horses by seed of *C. occidentalis*.] Compt. Rend. Soc. Biol. 92: 555-557. 1925.—In 1913 and 1924 many horses in the neighborhood of Paris were killed by eating oats in which seed of *C. occidentalis* had been placed to increase the weight. The animals weaken and later become paralyzed. Chrysarobin, soluble in alcohol but not in water, is the toxic agent, which explains why water extracts are not poisonous.—*Oran Raber.*

3984. BULLOCK, K. A chemical examination of the oleo-resin of Indian valerian root. Pharm. Jour. 115: 122-125. 1925.—The sample of Indian valerian examined was found to contain a relatively large proportion of free acids, of which valerianic acid formed the greater part. The other acids present were found to be a somewhat complex mixture of saturated and unsaturated fatty acids. Resinification is easily brought about by the action of acids, alkalis, and heat; it is partially due to oxidation of the unsaturated fatty acids. The fatty matter does not appear to be of the nature of a glyceride. The unsaponified matter seems to contain a liquid hydrocarbon and a semi-solid high boiling alcohol. Since the valerianic acid, one of the saturated fatty acids, and the lower boiling portion of the unsaponified matter are volatile in steam, these would occur in the ordinary "volatile oil" of Indian valerian, the other constituents of which have not so far been isolated.—*E. N. Gathercoal.*

3985. BUNTING, G. A. Jewel weed vs. poison ivy. Amer. Forests and Forest Life 30: 495-496. 2 fig. 1924.—Jewel weed (*Impatiens*) is advocated as a cure for poison ivy poisoning.—*Chas. H. Otis.*

3986. CLARK, A. J., AND W. A. BROOM. The activity of pharmacopoeial preparations of Ergot. Yearbk. British Pharm. Conference 1923: 621-630. 1924.—(See Bot. Absts. 13, Entry 2883.)

3987. COFMAN-NICORESTI, J., AND SNOW B. TALLANTYRE. The international standardization of Quillaja preparations. Yearbk. British Pharm. Conference 1923: 722-732. 1924.—(See Bot. Absts. 13, Entry 6125.)

3988. CUMMING, WILLIAM M. The identification of alkaloids. Pharm. Jour. 115: 140-143. 14 fig. 1925.—The hydroferro- and hydroferri-cyanic acids combine with aromatic bases in acid, neutral, and alcoholic solution, though the compositions of the salts of the same base obtained under these different conditions are different. This fact is of value in the detection and identification of alkaloids. Photographs are presented of the crystallization of these salts of cinchonine, quinine, phenazone, pyramidon, cocaine, narcotine, and strychnine.—*E. N. Gathercoal.*

3989. DOTT, D. B. Note on morphine hydrate. Pharm. Jour. 115: 137. 1925.—Morphine dried at a temperature somewhat less than 100°C. may retain 1 molecule of water which would be lost if dried at 100°C. In making the estimation of morphine in opium where the morphine

is weighed after drying, this is an important item. The interior of the water oven frequently does not reach 100°C. The presence of the 1 molecule of water adds 5.94% to the weight of the morphine.—*E. N. Gathercoal.*

3990. DOWELL, C. T. A study of the cyanogenesis in *Sorghum vulgare*. Oklahoma Agric. Exp. Sta. Bull. 122. 1-8. 1919.

3991. EDER, R., UND F. HAUSER. Neue Untersuchungen über das Chrysarobin. [New investigations with chrysarobin.] Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. 1925: 321-347, 436-451. 1925.—The authors separate several anthraquinones and other constituents from chrysarobin. Reactions of these constituents are given with the object of proving their constitution.—*Elmer H. Wirth.*

3992. FAHMY, IBRAHIM RAGAB. Manchurian liquorice root. Yearbk. British Pharm. Conference 1923: 591-600. 6 fig. 1924. (See Bot. Absts. 13, Entry 2886.)

3993. FEIST, K., UND H. BESTEHORN. Über den Gerbstoff des Eichenholzes. Methoden zur Gewinnung und Reinigung von Gerbstoffen. Zweiter Teil. [Oak tannins. Methods of isolating and purifying tannins. II.] Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. 1925: 16-31. 1925.—Several tannins were extracted and purified. The properties of these tannins together with the effect of enzymes upon them, their reactions, etc., are studied. (See also Bot. Absts. 14, Entry 8028.)—*Elmer H. Wirth.*

3994. FEIST, K., UND G. L. DSCHU. Über die Alkaloide der Columbowurzel. [The alkaloids of *Calumba* root.] Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. 1925: 294-305. 1925.—Various alkaloids including palmatrubine, columbamine and jatrorrhizine were isolated from the root of *Jateorrhiza palmata*, and addition and oxidation products of the alkaloids studied.—*Elmer H. Wirth.*

3995. FINNEMORE, HORACE. West Australian sandal wood oil. Pharm. Jour. 115: 168-169. 1925.—This oil is obtained from the wood of *Fusanus spicatus* (*Santalum cygnorum*); hence is different in source from the East Indian sandal wood oil obtained from the wood of *Santalum album*. The oil is now being produced in considerable quantity and is claimed to contain the full percentage of active ingredients required by the British and other pharmacopoeias for sandal wood oil. Chemical examination, however, indicates that it varies from East Indian oil in the following points: (a) The lower negative optical activity and the dextro-rotation of the residual oil after distilling off 20% from the original oil; (b) the lower percentage of alcohols (76 and 78) against a minimum of 90% in East Indian oil; (c) the ease with which the alcohols decomposed when the oil was distilled, even in an atmosphere of CO₂ at 12 mm. pressure; (d) the small percentage of "santalenic" acid (8) as against 20%, when oxidized with permanganate by Chapman's process. An examination of the alcohols indicates a great similarity in these constituents of the 2 oils. However, both alpha and beta santalol from East Indian oil are primary alcohols while alpha and beta fusanol from West Australian oil are not primary alcohols.—*E. N. Gathercoal.*

3996. GREENISH, HENRY G., AND C. E. CORFIELD. Note on East African Cinchona barks. Yearbk. British Pharm. Conference 1923: 650-656. 1924. (See Bot. Absts. 13, Entry 2889.)

3997. GREENISH, HENRY G., AND CYRIL W. MAPLETHORPE. A further examination of *Artemisia brevifolia*. Yearbk. British Pharm. Conference 1923: 646-650. 1924.—(See Bot. Absts. 13, Entry 2890.)

3998. GRÉGOIRE, F. Note sur un appareil à emplois multiples destiné à étudier l'extraction du parfum de fleurs ou plantes. [Note upon an apparatus for use in the study of extraction of perfume from flowers or plants.] Trav. Sci. Univ. Rennes 17: 17-20. 1924.

3999. GRIER, JAMES. An investigation of Colchicum and its galenicals. Yearbk. British Pharm. Conference 1923: 611-621.—(See Bot. Absts. 13, Entry 2892.)

4000. HAAS, PAUL, AND BARBARA RUSSELL-WELLS. Note on the chemical and physical characters of certain mucilaginous extracts of seaweeds. Yearbk. British Pharm. Conference 1923: 644-645. 1924.—The mucilaginous extract obtained from Irish Moss has been designated as an ethereal sulphate in which an organic complex is combined with CaSO₄ in which the ionized Ca suggested that the mucilage belongs to the group of colloidal electrolytes. This is verified by experiment. Similar extracts which are analogous colloidal electrolytes exerting measurable osmotic pressures have been obtained from several red algae, namely, *Ceramium*

rubrum, *Delesseria sanguinea*, *D. alata*, *Polysiphonia fastigiata*, *Plumaria elegans*, and in 1 brown alga, *Ascophyllum nodosum*.—*E. N. Gathercoal*.

4001. HAMET, RAYMOND. Sur la toxicité de la corynanthine. [The toxicity of corynanthine.] *Compt. Rend. Soc. Biol.* 92: 1420-1422. 1925.—The toxicity of this alkaloid, isolated from the bark of *Pseudocinchona africana*, in relation to guinea pigs is given. It is thought by some to be an isomer of yohimbine which comes from a related species of the Rubiaceae, but it is much less toxic. The lethal dose for corynanthine sulphate injected subcutaneously is 160 mg. per kg.; for yohimbine chlorhydrate, 24 mg.—*Oran Raber*.

4002. HERBOTH, L. Über den Glucosid-Gehalt des Waldmeisters (*Asperula odorata*). [The glucosidal content of *Asperula odorata*.] *Arch. Pharm. u. Ber. Deutsch. Pharm. Ges.* 1925: 180-181. 1925.—By hydrolysis of the glucoside and subsequent polarization of the resulting sugar the author found that the quantity of glucoside present in the above ground portions of the plant was about 6 times greater in plants gathered in spring than in summer. One of the resulting products of the hydrolysis of the glucoside is coumarin which may be obtained in crystalline form by distillation with water and shaking the distillate with ether. The author concludes that the difference in intensity of the odor of the plant in spring and summer is due to the quantity of glucoside present.—*Elmer H. Wirth*.

4003. HIRST, H. M. H. Scarborough herb garden. Report for 1924. *Pharm. Jour.* 114: 326-327. 1925.—About 30 species are reported upon in this 3rd annual report. It is noted that the winter of 1924-1925 was unusually mild with no snow and perhaps 12 hoar frosts, the ground being soft again by 9 or 10 A. M. Roses and carnations have been in bloom out-of-doors all winter. Much trouble has been experienced with plant pests, especially slugs, *Hyoscyamus niger* and *Datura Stramonium* being the chief sufferers. It is recommended especially that the commercial cultivation of *Aconitum napellus*, *Atropa Belladonna*, and *Digitalis purpurea* be much extended. *Podophyllum emodi* does splendidly and could be very successfully cultivated in England.—*E. N. Gathercoal*.

4004. HOLMES, E. M. The sumbul root of commerce. *Pharm. Jour.* 115: 633. 1925.—For many years commercial sumbul root has possessed a musky odor, but commercial samples recently examined possess a marked flavor of angelica. An investigation of the literature indicates that sumbul grown in Kew gardens in 1875 gave a root having the exact flavor of angelica, and certain other references in the literature indicate that plants supposed to be *Ferula Sumbul* also possessed this flavor. It was suggested to the author some years ago that the character of the commercial sumbul was changing. It is possible that the plant from which the drug formerly came has been largely exterminated and the present commercial root is being obtained from a closely allied species. It would be interesting to investigate further not only the constituents but the microscopic structure of the present article with the commercial article of several years ago.—*E. N. Gathercoal*.

4005. HOLMES, E. M. Umburana seed. *Pharm. Jour.* 114: 328-329. 1925.—*Amburana Claudii* is a large tree occurring in Minas Geraes, Brazil. Its excellent timber is used for the manufacture of planks, rafters, window-frames, mash tubs, etc., and is much sought after for these purposes. Its seeds which are winged, blackish, rounded and wrinkled, serve for perfuming tobacco, and possess a strong odor of coumarin.—*E. N. Gathercoal*.

4006. HOOPER, E. S., AND K. M. KING. The international standardization of *Colchicum* preparations. *Yearbk. British Pharm. Conference* 1923: 719-722. 1924.—(See Bot. Absts. 13, Entry 6128.)

4007. HOWARD, BERNARD F., AND OLIVER CHICK. The composition of *Cinchona* febrifuge mixtures, with special reference to their quinidine content. *Yearbk. British Pharm. Conference* 1923: 634-643. 1924.—In India the bark of *Cinchona succirubra* has been extensively used for the production of a febrifuge which consists of a mixture of all of the alkaloids contained in the bark. The early analysis of this febrifuge indicated about 9% quinine alkaloid, 7% cinchonidine, 20% cinchonine alkaloid, 28% quinidine alkaloid and 35% amorphous alkaloid. In more recent years, however, it has been the practice to remove from the extraction liquor, the alkaloids most readily crystallizable which constitute about 80% of the quinine and 60% of the cinchonidine. To this depleted mixture was frequently added a considerable proportion of quinidine. It has, however, been a common commercial custom also to prepare

a very deficient extract of a bark at as low a cost as possible and to place it on the market in competition with the more highly purified and more expensive febrifuge. Medical practitioners generally are of the opinion that this Indian febrifuge represents all of the alkaloids from the bark in a relatively pure state. Both of the practices mentioned above, therefore, should be discredited.—*E. N. Gathercoal.*

4008. JACK, H. W., AND J. H. DENNETT. The effect of tapping coconut palms for toddy on the copra and oil produced from subsequent fruiting. *Malayan Agric. Jour.* 13: 302-308. 1925.—Nuts from tapped palms were found to contain rather less copra than those from untapped palms, and the oil content of the copra was less. Details of analysis of 50 nuts of each kind are given.—*R. E. Holttum.*

4009. JONES, A. J. International standardization of Belladonna and its preparations. Yearbk. British Pharm. Conference 1923: 692-707. 1924.—(See Bot. Absts. 13, Entry 6129.)

4010. JONES, THOMAS GILBERT HENRY, AND FRANK BERRY SMITH. Olefinic terpene ketones from the volatile oil of flowering *Tagetes glandulifera*. Part I. *Jour. Chem. Soc. (London)* 127: 2530-2539. 1925.

4011. KALFF, JAN, AND ROBERT ROBINSON. A synthesis of datisctetin. *Jour. Chem. Soc. (London)* 127: 1968-1973. 1925.—A description is given of methods used to synthesize the non-glucose portion of the glucoside datiscin occurring in the leaves of Bastard hemp (*Datisca cannabina*). It was further found that galangin is present in the roots.—*F. E. Denny.*

4012. KELLER, O. Untersuchungen über die Gruppe der Helleboreen. [Investigations in the Hellebore group.] *Arch. Pharm. u. Ber. Deutsch. Pharm. Ges.* 1925: 274-293. 1925.—*Delphinium elatum* was examined for alkaloids and several new ones were isolated. *Delphinium Staphisagria* contains largely delphinine and some delphisine and also very small quantities of a crystallizable base. The formula for delphinine is determined and a new oxidation product is made. Reactions of these compounds are studied.—*Elmer H. Wirth.*

4013. KELLER, O., UND X. BERNHARD. Untersuchungen über die Alkaloide der Brechurzel. [Investigations with the alkaloids of *Ipecac.*] *Arch. Pharm. u. Ber. Deutsch. Pharm. Ges.* 1925: 401-424. 1925.—This paper represents the 4th part of a larger paper on the subject of the alkaloids of *Uragoga Ipecacuanha*. Previous researches regarding the alkaloids are discussed. New addition compounds are made with the alkaloids and the crystalline forms of some of their salts are described together with illustrations. Deductions regarding the relation of the ring systems in emetine are made.—*Elmer H. Wirth.*

4014. KEMP, MARTHA. Über das Pimentblätteröl. [Oil of *Pimenta* leaves.] *Arch. Pharm. u. Ber. Deutsh. Pharm. Ges.* 1925: 12-16. 1925.—The author examined the oil of the leaves of *Pimenta officinalis*. The yellowish brown oil has a density of 1.062; it is 95% eugenol. Two acids were also found, one solid ($C_{13}H_{14}O_4$) and one liquid ($C_{10}H_{14}O_4$). A small quantity of caryophyllen was also present.—*Elmer H. Wirth.*

4015. KOBAYASHI, KIUHEI. Artificial petroleum from soya bean oil, palm oil and stearine. *Jour. Chem. Indust. Tokyo* 24: 1421-1424, 1921.—The author heated soya bean oil, cocoanut oil and stearine separately with Japanese acid clay, distillation being completed at about 700°. The crude oils were then subjected to fractional distillation, and the fractions corresponding to light oil, illuminating oil, neutral oil and heavy oil were obtained. Crude petroleum yields were as follows: From Soya bean oil (sp. gr. 0.9268, sap. value, 192.3), 55% having a sp. gr. of 0.8300 and sap. value of 23.1; from Cocoanut oil (sp. gr. 0.9242, sap. value, 253.5), 54.7% having a sp. gr. of 0.8176 and sap. value of 83.5; from Stearine (m. p. 53°, neutr. value 211), 63.4% having a sp. gr. of 0.8177 and sap. value of 52.2.—*T. Maki (Courtesy Japanese Jour. Chem.).*

4016. KOFLER, L., UND M. BRAUNER. Über den unangenehmen Geschmack der Radix Primulae. [The disagreeable taste of *Radix Primula*.] *Arch. Pharm. u. Ber. Deutsch. Pharm. Ges.* 1925: 424-430. 1925.—The authors conclude after several experiments with extracts of *Primula veris* and *Primula elatior* that the disagreeable taste is due to a substance which they have named "Primelkratzstoff." It is not identical with the saponin found in primula root and is separable from it. The authors state that they have been unable to place the substance in any group of plant constituents.—*Elmer H. Wirth.*

4017. LEMESLE, R. Contribution à l'étude toxicologique des Ombellifères. [Toxicology

of the Umbelliferae.] Bull. Soc. Sci. Nat. Ouest France 4e. sér. 3: 25-56. 1923.—This treatise occurs in 2 parts. The 1st part treats of the results obtained by the author after introducing into warm blooded animals (guinea pigs, rabbits and dogs) different organs of reputedly toxic Umbelliferae. The 2nd part relates to the results observed by the author after inoculating white rats with a little of the distillate from the extract of dried umbelliferous plants and also how certain cold blooded animals (eel, tench and frog) reacted to similar inoculations.—*From A. de Puymaly (translated).*

4018. McDOWALL, FREDERICK HENRY. Constituents of *Myoporum laetum*, Forst., (the Ngaio) Part I. Jour. Chem. Soc. (London) 127: 2200-2207. 1925.

4019. MAHEU, JACQUES. Les toubas parasitocides, *Derris elliptica* Benth. et *Derris uliginosa* Benth., Légumineuses. Bull. Sci. Pharm. 32: 134-145. Pl. 1. 1925.—Following a historical account of these two species of plants having insecticidal properties, the author takes up their habitat, synonyms, external morphology, anatomical characters, secretory elements, tannin cells, etc., and then discusses the character of the drug.—*Frederick V. Rand.*

4020. MAMELI-CALVINO, EVA. Localizzazione dei glucosidi cianogenetici nel *Prunus occidentalis* Sw. e nel *P. Myrtifolia* (L.) Urb. [Localization of the cyanogenetic glucoside in *Prunus occidentalis* and in *P. myrtifolia*.] Atti R. Accad. Lincei Roma [Rendiconti Cl. Sci. Fis. Mat. e Nat.] 32: 423-430. 1923.—The cortices of 2 trees, *Prunus occidentalis* and *P. myrtifolia*, are used extensively in Cuba as a popular remedy for affections of the respiratory tract. By microchemical means, in both cases, a cyanogenetic glucoside was found in the cortex and in the foliage. Using the method of Treub the author was able to establish its localization in the parenchyma, pericycle, and foliage phloem and in all of the layers of transverse sections of twigs between epidermis and cambium. The glucoside is not found in the epidermis, the middle lamella or the xylem, either of branches or foliage. The nitrate of mercury method of Peche did not prove well adapted to microchemical use. Microscopic examinations did not reveal the presence of alkaloids in the cortex or foliage of the 2 species studied.—*F. M. Blodgett.*

4021. MAPLETHORPE, CYRIL W. Examination of the bark of *Erythrophleum guineense*. Yearbk. British Pharm. Conference 1923: 600-611. 1924.—(See Bot. Absts. 13, Entry 2901.)

4022. MAPLETHORPE, CYRIL W., AND NORMAN EVERS. The picrates of the opium alkaloids. Pharm. Jour. 115: 137-139. 10 fig. 1925.—The pure picrates of morphine, codeine, narcotine, narceine, papaverine, cryptopine, gnoscopine and xanthaline were prepared. The melting point, solubility in water, absolute alcohol and acetone, crystallization from 50% alcohol and an analysis showing the picric acid found and this compared with that required for the mono-picrate, are presented. The following points are noteworthy: The disagreement of some of the melting points obtained with published figures; the solubilities in water of the picrates of morphine, codeine, and thebaine as compared with those of the other opium alkaloids; and the high solubilities in acetone of the picrates of the opium alkaloids and the slight solubility in absolute alcohol.—*E. N. Gathercoal.*

4023. MARR, H. V. A report on four years experimental cultivation of peppermint in Western Australia. Jour. Dept. Agric. Western Australia 2nd Ser. 2: 178-180. 1925.—The author points out that it has been stated frequently that "when peppermint is transplanted to districts outside of its particular home in England, the chemical and physical properties of the essential oil undergo change; also that the most important property, that of the aroma, is subject to alteration." Several analyses presented, each representing the crop for a particular year, in the main are consistent and compare favorably with the analysis given for a typical "English Mitcham Peppermint Oil." Aroma is quite independent of chemical analysis, and the only information upon this point is that "the local oil has been favorably commented upon."—*P. J. Olson.*

4024. MARTIN, S. H. Five cases of atriplicism. China Med. Jour. 39: 808-809. 1925.—Because of the failure of the crops in Kirin, Manchuria, many poor people have been eating various herbs, among them *Atriplex serrata* which often causes severe poisoning. The symptoms are intense swelling of the face, hands and arms followed by edema of the eyelids and fingers. In untreated cases, after 2-3 days, superficial gangrene and cyanosis set in. Women seem to be more susceptible than men. The disease may be cured by treating the affected

parts with a saturated solution of magnesium sulphate in glycerine and giving large doses of salts and salol internally.—*C. S. Gibbs.*

4025. MELLOR, ERNEST M. The countries our drugs come from. *Pharm. Jour.* 114: 317-320. 1925.—The author discusses some phases of the production of various South American drugs, including *krameria*, *cinchona*, *coto*, *matico* and *coca*. Bolivian *krameria* is included in the commercial classification of "Peruvian," since both are obtained from *Krameria triandra* and exported via Peru. *Matico* grows in damp forests. Plenty of *Cinchona* trees occur in Bolivia, but the owners do not work them on account of high transportation costs. The absence of true *coto* bark in commerce can possibly be attributed to the scarcity of reliable and experienced collectors and to living conditions in Bolivian forests. The most important center for the cultivation of *coca* in Bolivia is the Yungas of La Paz, although this drug plant is also grown in other districts.—*E. N. Gathercoal.*

4026. MELLOR, ERNEST M. The countries our drugs come from. XVI. Brazil. *Pharm. Jour.* 115: 596. 1925.—The author briefly discusses the collection of caoutchouc, *copaiba*, *guarana*, *ipecacuanha*, *krameria*, *pareira*, *simaruba*, *jaborandi*, Winter's bark, *araroba*, Tonquin beans, *quassia*, and *matico*. The country also produces varieties of *cinchona*, *sarsaparilla*, *giant*, *colchicum*, *tamarind*, *jalap*, *centaury*, *rue*, and *valerian* as well as *Maté*. A number of poisonous plants, particularly *Strychnos Castelnaeana*, are used by the Indians in making arrow poison.—*E. N. Gathercoal.*

4027. MITCHELL, CHARLES AINSWORTH. The distillation of the essential oils of flowers and herbs. 8 p. [Carriek: Tamworth, England, 1924.]—" . . . written to complete the . . . series of pamphlets on medicinal and commercial herbs, published by Mrs. Grieve."

4028. MOUSSU, RAYMOND. L'intoxication par les graines de *Cassia occidentalis* L. est due à une toxalbumine. [The toxic effect of *C. occidentalis* seed is due to a toxalbumin.] *Compt. Rend. Soc. Biol.* 92: 862-863. 1925.

4029. MURAYAMA, YOSHIATSU. [The ethereal oil from *Mosla japonica*.] (Japanese.) *Jour. Pharm. Soc. Japan* 1921: 769-786. 1921.

4030. ONSLOW, FORSTER MARTIN, AND KESHAVIAH ASWOTH NARAIN RAO. d-Mannitol from *Gardenia turgida*. *Jour. Chem. Soc. (London)* 127: 2176. 1925.—From a resin exuded from *Gardenia turgida*, pure d-Mannitol was obtained, the yield being 40% of the dried exudation.—*F. E. Denny.*

4031. PFAU, ERNST. Über Ligulin, den Farbstoff der Ligusterbeeren. [Ligulin, the coloring material from privet berries.] *Arch. Pharm. u. Ber. Deutsch. Pharm. Ges.* 1925: 50-51. 1925.—The author tried several reactions with both aqueous and alcoholic extracts of privet berries and, although no conclusions as to the constitution of ligulin were reached, surmises that ligulin resembles oenin. The studies will be continued.—*Elmer H. Wirth.*

4032. PORSCH, O. [Rev. of: MARZELL, H. *Unsere Heilpflanzen, ihre Geschichte und ihre Stellung in der Volkskunde.* (Our medicinal plants, their history and their place in popular lore.) *Illus. Th. Fisher: Freiburg i Br., 1922.*] *Centralbl. Gesam. Forstw.* 49: 181. 1923.

4033. PRAIN, DAVID. Some useful plants of India. *Pharm. Jour.* 115: 577. 1925.—Especially attention is given to *Cannabis* and *Cinchona*. The differences between *bhanga*, *ganja* and *charas* are explained. An extract made from freshly harvested *Cannabis sativa* is much stronger than from that harvested for some months. *Cannabis Indica* a year old has lost as a rule, $\frac{2}{3}$ of its medicinal value. *Cinchona* bark, other than the Yellow Bark, can again be grown with profit and it is possible that even the bark of *Remijia* species might again come into use.—*E. N. Gathercoal.*

4034. READ, BERNARD E. Inner Mongolia. *Pharm. Jour.* 115: 570-573. 1925.—The medicinal and economic flora of inner Mongolia, on a journey directly East from Hallong Osso to Gol Chagan, presents a number of interesting features. The country is generally treeless, though occasional forests are found. Alfalfa is now being extensively cultivated with 3 annual crops. *Tamarix chinensis* is found in quantity growing into bushes about 2 feet in height and is extensively cut for commercial uses. The Compositæ are splendidly represented, with many species of *Artemisia*, *Senecio*, *Cnicus*, etc. Extensive growths of

Equisetum arvense, *Plantago major*, and *Linaria vulgaris* were noted. Frequently the pastures and plains are practically covered with flowers in great masses. Areas of *Gentiana decumbens*, *Glycyrrhiza uralensis*, *Leonurus sibiricus*, several species of *Allium*, *Scilla chinensis*, *Hyo-scymus niger*, *Datura* spp., *Potentilla* spp., *Polygala tenuifolia*, *Dianthus chinensis*, *Geranium sibiricum*, *Cynanchum Bungei*, and *Cuscuta chinensis* were noted. Several vetches, shepherd's purse, dandelion, and common thyme are found extensively.—*E. N. Gathercoal*.

4035. RECORD, SAMUEL J. Chemical analysis of balsa bark. Tropical Woods 2: 1. 1925.—The bark of *Ochroma* sp. contained only 1.22% of tannin (dry basis), hence is without value as a commercial source of tannin.—*W. N. Sparhawk*.

4036. RIPERT, JEAN. Recherches sur l'atropine et ses variations suivant les mileux. [Investigations on atropine and its variations according to conditions.] Rev. Bretonne Bot. 1: 57-61. 1922.—I. The author reports some experiments with cleft-grafts of woody bitter-sweet upon the root of belladonna. There is a diminution in the quantity of alkaloids in the root due to the passage of certain amounts across the union into the scion. However, this translocation varies with the age of the grafted members and the functional activity of the scion at this particular time. II. It is shown that alkaloids increase in belladonna shoots kept for a time in the dark, and that the alkaloids decrease to a certain extent when the parts are subsequently exposed to the light. The experiments also show a loss in total organic nitrogen. The author has demonstrated that the disappearance of some of the alkaloids of this plant is accompanied by a loss of gaseous nitrogen.—*P. D. Strausbaugh*.

4037. [RUUTOVSKII, B. N.] Рутковский, Б. Н. О крымских растениях, содержащих Эфирные масла. [Crimean plants containing essential oils.] Трубы Научного Химико-фармацевт. Инст. Выпуск. [Trans. Sci. Chem.-Pharmaceut. Inst.] 8. 1-32. [Moscow] 1923.—A report of the scientific expedition of the Institute, listing a number of plants which contain essential oils, followed by a discussion of the possibilities for growing such plants on a large scale.—*L. J. Pessin*.

4038. [RUUTOVSKII, B. N., S. A. BUSSE, I. V. VINOGRADOVA, P. P. LEONOV, L. G. TSÛRIKH, A. P. KONDRATSKII, AND I. P. TIMOFEEV.] Рутковский, Б. Н., С. А. Буссе, И. В. Виноградова, П. П. Леонов, Л. Г. Цюрих, А. П. Кондрацкий, и И. П. Тимофеев. О Русских эфирных Маслах. Сборник II. [Russian essential oils. II.] Труды Научн. Химико-фармацевтического Инст. Вып. [Trans. Sci. Chem.-Pharmaceut. Inst.] 10. 1-102. [Moscow] 1924.—A series of 14 papers by the various authors named above, on the chemical study of essential oils obtained from plants collected in Crimean, Caucasian and Ukrainian regions.—*L. J. Pessin*.

4039. SCHULZE, H., UND G. BERGER. Zur Kenntnis der Aconitalkaloide. Ein neues Alkaloid aus Aconitum Napellus. [The Alkaloids of Aconite. A new alkaloid from Aconitum Napellus.] Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. 1924: 553-562. 1924.—The alkaloids of *Aconitum Napellus* are studied and a new alkaloid is found which the authors name "neopellin." This alkaloid upon treatment with alkali in alcoholic solution splits up into acetic acid, benzoic acid and a new base which the authors have named "neolin." Various reactions of neopellin and neolin are discussed.—*Elmer H. Wirth*.

4040. SHORT, G. R. A. The structure of coscinium. Pharm. Jour. 115: 156-162. 12 fig. 1925.—A drug imported as the stem of *Berberis aristata*, proved to be the stem of *Coscinium fenestratum*. An extended histological investigation with illustrations leads to the following summary: Several commercial samples of *B. aristata* stem proved to consist entirely of *Coscinium* stem. Externally, *Coscinium* stem is easily distinguished by the yellowish-grey, frequently furrowed or wrinkled cork, the bright greenish-yellow color of the freshly cut transverse surface, the crenate ring of sclerenchyma and semi-lunar masses of phloem, and the markedly radiate wood, with large vessels and absence of annual rings. Very young stems can be quickly recognized by the epidermal hairs. Commercial specimens always have a well-developed cork, so that the hairs are no longer available. The other features by which *Coscinium* can be distinguished from *Berberis* are the light porous wood, wide medullary rays, and the lacunae produced by shrinkage of the phloem.—The stem of *C. Wallichianum* was also examined, and is distinguished by the epidermal hairs and the frequent occurrence of sclerenchyma in the pith.—To distinguish genuine commercial *C. fenestratum* from *C. Walli-*

chianum it is necessary to rely principally upon the structure of the pith, which in *C. fenestratum* shows an almost complete absence of sclerenchyma.—*E. N. Gathercoal*.

4041. SMITH, WRIGHT. A botanical tour in the Himalaya. Pharm. Jour. 115: 641. 1925.—Much attention is given to the cultivation of *Cinchona* and of tea.—*E. N. Gathercoal*.

4042. STEVENS, H. B. The international standardization of Opium and its preparation. Yearbk. British Pharm. Conference 1923: 707-718. 1924.—(See Bot. Absts. 13, Entry 6140.)

4043. UNGER, W. Ein Beitrag zur anatomischen Kenntniss der Kräuterdrogen. (Herb. Polygoni.) [A contribution to the anatomic knowledge of herb drugs (Herb. Polygoni).] Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. 1925: 506-513. 1925.—The anatomy of the entire plant of *Polygonum aviculare* is discussed. Photographs of the plant and histological drawings are included.—*Elmer H. Wirth*.

4044. UNGER, W. Radix Belladonnae und Radix Sambuci Ebuli. [Belladonna and Sambucus Ebulus roots.] Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. 1925: 606-611. 1925.—Anatomical differences between the rhizome and roots of *Atropa belladonna* and those of *Sambucus Ebulus* are discussed. Photographs of the drugs and histological drawings of each are given.—*Elmer H. Wirth*.

4045. WAGNER, S. Sur les menthes poivrées provenant de Dol-de-Bretagne. [The peppermints of Dol-de-Bretagne.] Rev. Bretonne Bot. 1: 43-47; Trav. Sci. Univ. Rennes 16: 23-27. 1922.—An analysis shows that these mints rank high in the amount of free and total menthol contained.—*P. D. Strausbaugh*.

4046. WARE, A. H. The identification by chemical methods of drugs containing tannins. Pharm. Jour. 115: 131-135. 1925.—The H reduction test produces a striking red color with aromadendrin so delicate that 0.5 mg. of aromadendrin in 5 cc. of alcohol will yield a very decided pink tinge to the test. The following plant phenols yield negative results to this test, namely, gallic acid, gallotannin, brazilin, haematoxylin, ellagic acid, various catechins, phloridzin, aloin, etc. The aromadendrin can be shaken out of an aqueous extract by means of ether. The ethereal solution can then be separated, the ether evaporated and the residue dissolved in 90% alcohol to which solution the test can be applied as follows: Place a piece of pure Zn or Mg in the solution with sufficient strong HCl to give a steady stream of H. The pink color appears slowly to a maximum of deep cerise and gradually loses its intensity as the aromadendrin or the HCl is used up. Aromadendrin is quite common in a number of the Eucalyptus kinos and perhaps in other tannin-containing substances.—A test for distinguishing between substances containing phlobatannins and pyrogallol-tannins is presented and also tests for dividing the pyrogallol-tannins into 4 distinct classes. An identification table is appended covering practically all tannin-bearing substances.—*E. N. Gathercoal*.

4047. ZELLNER, JULIUS. Studien über die chemischen Bestandteile heimischer Arzneipflanzen. [Studies of the chemical constituents of native (German) medicinal plants.] Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. 1925: 161-179. 1925.—(See also Bot. Absts. 14, Entry 8040.)—Several constituents were isolated from the following plants; empirical formulae were established for the constituents, and reactions for several are given: *Pulmonaria officinalis* L., *Menyanthes trifoliata* L., and *Hypericum perforatum* L. Of the last, separate analyses of stem, branches, flowers, fruits and of the volatile oil were made.—*Elmer H. Wirth*.

4048. ZÖRNIG, H. Über Verfälschungen von Arzneidrogen. [The adulteration of medicinal plant drugs.] Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. 1925: 197-216. 1925.—Recent adulteration of 68 drugs is discussed, together with specific instances and methods of detection.—*Elmer H. Wirth*.

4049. ZÖRNIG, H., UND G. WEISZ. Beiträge zur Anatomie des Laubblattes offizineller und pharmazeutisch gebräuchlicher Compositen-Drogen. [Contribution to the anatomy of the foliage leaves of official and pharmaceutically useful composite drugs.] Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. 1925: 451-470. 1925.—The morphology of the foliage leaves of 53 drug plants of the Compositæ are discussed, together with their histological relationships, and with special reference to their diagnostic features. Several drawings, and a classified table for aid in their identification, are given.—*Elmer H. Wirth*.

PHYSIOLOGY

B. M. DUGGAR, *Editor*W. J. ROBBINS, *Assistant Editor*

(See also in this issue Entries 3150, 3242, 3335, 3340, 3342, 3355, 3356, 3404, 3406, 3414, 3492, 3551, 3662, 3678, 3689, 3699, 3708, 3718, 3738, 3811, 3812, 3975, 3988, 4408)

GENERAL

4050. McCLENDON, J. F., AND GRACE MEDES. *Physical chemistry in biology and medicine*. 425 p., 34 fig. W. B. Saunders Co.: Philadelphia and London, 1925.—“ this book is intended for research workers in biology and medicine Very often the biologist fails to receive early training which he later feels the need of. Two alternatives are open to him, either to confine his biological studies to phases of the work which do not require the training which he has missed, or to turn back and make good his deficiencies. It is the latter alternative which we wish to encourage in choosing the subject matter we have included some of the results of our own researches together with those of others on related subjects. . . . ”—Part I (“Physicochemical”) takes up mass and volume, the colloid particle, intermolecular forces, electrolytic dissociation and chemical equilibria, and hydrogen ions.—Part II (“Physiological”) discusses radiant energy, atomic structure and physiological action, thermochemistry in the living body, colloids in organisms, hydrogen ions in biology, ionic equilibria in blood, osmosis, permeability (including electrical conductivity of plant tissues and juices, of bacteria, yeasts, etc.), and surface forces.—Author and subject indexes are provided.—*Frederick V. Rand.*

4051. MORSE, WITHROW. *Applied biochemistry*. 958 p., 256 fig. W. B. Saunders Co.: Philadelphia and London, 1925.—This book has “been written with a view to weaving the woof of biochemistry into the warp of medicine. . . . No apology is offered for the somewhat detailed and exhaustive treatment of many subjects.”—After an introductory section the following main subjects are discussed: Man and his environment; enzymes; the body and its maintenance; the “glucids;” the “lipids;” and “protids;” the special chemistry of the tissues; the chemistry of common foods; the digestion of foods; the absorption of foods; intermediate metabolism; nutrition from the chemical standpoint; energetics of nutrition; metabolic adjuncts; excretions of the body; methods for the determination of blood constituents; and metabolic studies on blood and urine.—An appendix gives various reagents, tables, pipette technique, logarithms, biochemical configurations, vitamin distribution in foods, normals, etc.—An index covers the final 38 pages.—*Frederick V. Rand.*

PROTOPLASM, MOTILITY

4052. BELEHRADEK, JAN. *La viscosité du protoplasma dans ses rapports avec l'activité et le vieillissement cellulaires*. [Relation of the viscosity of protoplasm to the activity and age of the cell.] *Compt. Rend. Soc. Biol.* 92: 1070-1072. 1925.—The speed of the protoplasm was measured in the leaves of the successive whorls of *Elodea densa* and found to vary from the top to the bottom inversely with age. To go a given distance required 1.9 minutes for the chloroplasts in the young leaves (first whorl); in the oldest leaves (whorl 34), 12.26 minutes. If speed depends upon viscosity and activity, then these vary with the age.—*Oran Raber.*

4053. STUDNÍČKA, F. K. *Der physiologische Typus der “vesiculosen” Zellen*. [The physiological character of “vesicular cells.”] *Zeitschr. Wiss. Biol. Abt. B, Zeitschr. Zellforsch. u. Mikrosk. Anat.* 2: 538-557. 23 fig. 1925.—The various types of “vesicular cells” found principally in the tissues of mammals, are described, and their histological structure is discussed in the light of their physiological activities.—*Ralph E. Cleland.*

DIFFUSION, PHYSICO-CHEMICAL PHENOMENA

4054. ALSBERG, CARL L., AND ELIZABETH P. GRIFFING. *The effect of dry grinding upon gels*. *Proc. Soc. Exp. Biol. and Med.* 23: 142-143. 1925.—Grinding of gelatin is capable of

affecting profoundly the physical properties of the biologically important gel-forming colloids.—*M. M. Brooks.*

4055. ASHESHOV, IGOR N. Préparation des membranes en collodion graduées. [Preparation of graduated collodion membranes.] *Compt. Rend. Soc. Biol.* 92: 362-363. 1925.—To make collodion membranes more permeable, acetone is added; to diminish permeability, amyl alcohol.—*Oran Raber.*

4056. BROOKS, MATILDA MOLDENHAUER. The effects of varying the internal and external pH of *Valonia* upon penetration of arsenic. *Proc. Soc. Exp. Biol. and Med.* 22: 148-150. 1924.—The sap, protoplasm and wall of *Valonia* were each analyzed for arsenic after the plant had been placed in solutions containing either trivalent or pentavalent arsenic. When the pH of both the external and internal solutions was low, more pentavalent and less trivalent arsenic was found in the protoplasm and the sap; the opposite was true when the external and the internal pH were high. Differences seem to be due to effects on the protoplasm and not to effects of dissociation of the acids themselves.—*Author.*

4057. EDERER, STEPHEN A. P. The effect of surface active substances on the diffusion of water through membranes. *Proc. Soc. Exp. Biol. and Med.* 23: 66-68. 1925.—When collodion sacs were treated first with surface active substances, the rate of diffusion of water through membranes into the electrolyte solution was increased with sodium chloride, sodium sulphate, sodium citrate and potassium ferrocyanide. Negative osmosis occurred with calcium chloride but not with aluminium salts.—*M. M. Brooks.*

4058. FUJII, KENJIRO. Über die Entlassung der Spermatozoiden von *Isoëtes*. [The discharge of the sperms of *Isoëtes*.] *Flora, N. Ser.* 18-19: 115-126. 1925.—Certain substances (acetylene, isoamylene, isobutylene, carbon monoxide, ethyl ether, methyl ether, also illuminating gas and extracts from rubber and caoutchouc) are effective in causing the discharge of sperms, while certain other substances (methane, ethane, carbon dioxide, ethyl bromide, ethyl chloride, amyl ether, benzyl ether) are ineffective. Narcotics such as chloroform, temperatures below 3°, and water-withdrawing agents prevent the opening of the antheridia. It is suggested that in the natural habitats of *Isoëtes* there is a breaking down of organic compounds with the formation of substances which are effective in increasing the permeability of the antheridial cells, thus causing the discharge of the sperms.—*A. G. Stokey.*

4059. GICKLHORN, JOS., UND RUD. KELLER. Über elektive Vitalfärbungen der Kiemen-säckchen von *Daphnia magna* Müller als Beispiel Organ- und Zellspezifischer Differenzierung. [Selective vital staining of the gill sacs of *Daphnia magna* Müller, as an example of specific differentiation among organs and cells. *Zeitschr. Wiss. Biol. Abt. B, Zeitschr. Zellforsch. u. Mikroc. Anat.* 2: 515-537. 5 fig. 1925.—Through the use of easily reduced metallic salts, such as AgNO_3 and KMnO_4 , and particularly of vital dyes, especially such as are easily reduced to colorless substances, it is shown that in the single-layered epithelium of the epipodites the network cells are largely reducing in their action; those of the interstices, largely oxidizing. Indicators show that the former are generally alkaline in reaction, while the granules of the latter are only very slightly alkaline to acid. By means of micro-electrodes it was found that the cells of the network are negative in potential, and the granules of the cells of the interstices are positive, although the ground-substance and the nuclei of the latter are for the most part negative.—*Ralph E. Cleland.*

4060. GIRARD, PIERRE. La perméabilité sélective des parois vivantes et inertes aux ions et les conséquences chimiques qu'elle comporte. [Selective permeability of living and inert membranes to ions and its chemical consequences.] *Ann. Physiol. et Physicochim. Biol.* 1: 194-211. 1925.—Selective permeability of the cornea and of inert membranes is considered from the electrochemical point of view.—*Joseph S. Caldwell.*

4061. GOMPEL, MARCEL. Sur la pénétrabilité des acides dans les cellules d'*Ulva Lactuca*. [Penetration of acids into the cells of *U. lactuca*.] *Ann. Physiol. et Physicochim. Biol.* 1: 166-177. 1925.—*Ulva* furnishes excellent material for studying the penetration of acids, the chlorophyll turning yellowish brown by acids. Below pH 4.4, no change in color occurred within 5 hours; at 4.4 all acids penetrated at the same rate. With higher concentrations, changes occurred in a period of time inversely proportional to the concentration. Arranged in the order of decreasing rate of penetration, at the same pH, the acids used were tri-, di-

and monochloro-acetic, propionic, butyric, citric, acetic, formic and lactic; and with greatly decreased rates, H_2SO_4 , HNO_3 , and HCl . Penetration consequently is not determined by degree of dissociation, surface tension or by solubility in lipoids, but depends in part upon properties of the protoplasm. These can be modified by physical or physicochemical means; centrifuging, heating or placing in strong alcohol for a very short time, or exposing to ether, chloroform, or acetone, results in practically instantaneous entrance of the acids. —*Joseph S. Caldwell.*

4062. GREY, EDGERTON C. The importance of surface for life. *Cairo. Sci. Jour.* 12¹⁴: 67-81. 1924.—The subject is discussed under 5 heads. (1) The macroscopic increase of surface. (2) The microscopic increase of surface. The area of the gas exchange surface of the human lungs is estimated at 150 sq. m. The exchange surface of the lymph spaces in a kilo of flesh is estimated at 6,000 sq. m. In the individual cells there are found many smaller structures with greatly increased surfaces, as the fibrils of muscle cells, hundreds of which are found in a cell. These internal surfaces are the really active ones in a cell. (3) The ultramicroscopic increase of surface. (4) How the surface acts. Surface is the seat of such energy phenomena as capillary attraction, coalescence and dispersion of drops, absorption, electrification, etc. Surfaces exhibit free energy, hence they tend to diminish. As the surface diminishes it tends to transfer the energy so freed to bodies about it. The author thinks that muscular energy can be explained on this principle, as well as capillary attraction. (5) The importance of a study of surface phenomena for advancing our knowledge of life.—*W. Carlton McQuiston.*

4063. MACDOUGAL, D. T. Absorption and exudation pressures of sap in plants. *Proc. Amer. Phil. Soc.* 64: 102-130. *Fig. 1-6.* 1925.—Experiments to determine the nature and cause of "negative" absorption and "bleeding" exudation pressures in plants were conducted, using *Carnegiea gigantea* stems for recording the course of distention of cell-masses by the auxograph, for measurements of pressures which may be set up by absorption and exudation and for the identification of the changes in permeability which attend such phenomena. Living cells contiguous to a bore-hole in the cortex with a water deficit of 25-40%, and a cell-sap with an osmotic value of about 7 atm. (atmospheres), set up absorption pressures of 36-52 mm. Hg when the cavity was filled with water. Solutions of CaCl_2 (0.01 M) with an osmotic value of 0.4-0.8 atm. in cortical cavities caused absorption pressures of 48-86 mm. Hg, the increased values being attributed to the action of Ca on the colloidal material of the cells. Replacements in cortical cavities showed that water followed by sucrose (0.3 M) gave exudation pressures of 66 mm. Hg. Water followed by CaCl_2 replaced by sucrose (0.3 M) gave exudation pressures of 40 mm. Hg, while CaCl_2 (0.01 M) replaced by sucrose (0.3 M.) gave 86-92 mm. Hg. The highest exudation pressures resulted when cortical cavities were filled with sucrose (0.2 M). Absorption pressures of 20-25 mm. Hg decreased to 0 on the 4th day, after which exudation pressure rose to 240 mm. Hg. The course of development and final results of absorption and exudation pressures are harmonious with known facts as to the influence of H-OH concentration. Absorption and negative pressures in stems are found to be due to osmotic and imbibitional action of living cells upon solutions placed in bore-holes and connected with manometers. Exudations are generally due to the local activity of living cells in cortex, etc., near cavities made in stems or on exposed surfaces of stumps. —*Wanda Weniger Brentzel.*

4064. MAYER, ANDRÉ, LUCIEN PLANTOFOL, ET RENÉ WURMSER. Étude calorimétrique de l'hydratation des mousses. [Calorimetric studies of hydration of mosses.] *Ann. Physiol. et Physicochim. Biol.* 1: 233-238. 1925.—The development of heat in the absorption of water-free material of *Hypnum triquetrum* is of the same order of magnitude as is observed with cellulose and starch. The phenomenon is therefore one of imbibition by the cellular constituents. It is only after the initial absorption of water which gives rise to the thermic effect has been completed that oxidation begins.—*Joseph S. Caldwell.*

4065. MESTREZAT, W., ET Y. GARREAU. Représentation des échanges ioniques dans les tissus. [Representation of ionic changes in tissues.] *Compt. Rend. Soc. Biol.* 92: 1441-1442. 1 fig. 1925.—A graphical method is described.—*Oran Raber.*

4066. MESTREZAT, W., ET Y. GARREAU. Vitesse de diffusion des ions à travers un septum dans ses rapports avec la présence de molécules extérieures susceptibles de fournir des ions d'échange. [Velocity of diffusion of ions through a septum in relation to the presence of molecules on the exterior capable of supplying ions in exchange.] Ann. Physiol. et Physicochim. Biol. 1: 212-232. 1925.—The presence of NaCl, yielding the highly mobile Cl ion, in the blood makes possible the rapid exchanges between blood and tissues and makes possible selective absorption.—*Joseph S. Caldwell.*

4067. ROBINSOHN, I. Die Färbungsreaktion der Narbe, Stigmatochromie, als morphobiologische Blütenuntersuchungsmethode. [The color reaction of stigmas.] Sitzungsber. Akad. Wiss. Wien. (Math.-Nat. Kl.), Abt. I, 133: 181-211. 2 pl. 1924.—The stigmas of flowering plants are colored by potassium permanganate or silver nitrate. The manganese reaction is independent of the surface configuration of the stigma. It is equally significant on smooth as on rough stigmas, or on moist as on dry surfaces. A specific physiological-chemical property seems to be the basis of the color reaction. According to the investigations only the part which is colored is the true stigma, that is, the part modified to catch the pollen and promote its germination. In general, all stigmas exhibit positive reactions, a negative reaction being shown thus far only by most genera of the Orchidaceae and by *Vinca*. The extent and intensity of the reaction is less with young than with ripe stigmas.—*H. Cammerloher (translated).*

4068. TAYLOR, C. V. Cataphoresis of ultramicroscopic particles in protoplasm. Proc. Soc. Exp. Biol. and Med. 22: 533-536. 1925.—When a micro-electrode was placed in protoplasm of *Stemonites elegans*, the ultramicroscopic particles in the protoplasm migrated, some to each pole and some remained stationary in the center of the field. An analogy is made by the author between the behavior of the particles and that of some of the amino acids when subjected to an electric current.—*M. M. Brooks.*

4069. URSPRUNG, A. Einige resultate der neuesten Saugkraftstudien. [Some results of the most recent studies of suction force.] Flora 118-119: 566-599. 1925.—This work includes a comparison of the effect of external factors on the suction force of tissue masses; the daily and annual periodicity, the relation to habitat, and a comparison of the suction force of root tip, leaf blade, and corolla. Soil moisture is the most important external factor, the force increasing as the moisture decreases. The changes related to humidity are attributed to the effect on soil moisture. Low temperature influences suction force through its effect on available water supply. The daily maximum (*Bellis perennis*) occurs about noon. There is a maximum in August with a 2nd maximum in February.—*A. G. Stokey.*

4070. WEIR, ALAN B. The coagulation of a colloidal solution by hydrogen ions. Jour. Chem. Soc. (London) 127: 2245-2248. 1925.—In the precipitation of Prussian blue sol by HCl, H₂SO₄, and citric acids the pH of the medium after precipitation was about the same, ranging from 1.80 for H₂SO₄ to 1.91 for citric. Acetic acid precipitated at a lower acidity (pH 2.27), and oxalic acid at a higher acidity (pH 0.91-0.79). After the dye was once precipitated by oxalic acid it could not be peptized by shaking with the precipitating mixture, but precipitates produced by other acids could be peptized by adding oxalic acid, and shaking. In the case of oxalic acid, "a strong protective adsorption of the anion is indicated."—*F. E. Denny.*

WATER RELATIONS

4071. HUBER, BRUNO. Die Beurteilung des Wasserhaushaltes der Pflanze. [Analysis of the water relations of plants.] Jahrb. Wissenschaft. Bot. 64: 1-120. 4 fig. 1924.—In non-succulent plants in which a balance between water requirement and water intake prevails, the water current is directly proportional to the difference between the suction force of the transpiring part and the soil, and inversely proportional to the conducting resistance. The plant must be able to develop a suction force at least equal to that of the soil. How much this force in the plant must exceed that of the soil depends upon the extent of the water current and the water conducting power. With change of external factors (soil resistance and evaporation) the water relations may be preserved by alteration of variable internal factors (suction force and transpiration force). The object of xerophytic adaptation in various

parts of the same plant is the same as for various individuals of the same species or of different plant types.—*W. J. Himmel.*

4072. WILSON, J. K. The nature and reaction of water from hydathodes. New York [Cornell] Agric. Exp. Sta. Mem. 65. 3-11. 1923.—Examination of water exuded from leaves of maize, oats and timothy grown in natural as well as in sterile cultures revealed that total solids were present up to 1030 parts per million in corn grown under non-sterile conditions and 573 and 220 parts per million for timothy grown under sterile conditions. Qualitative tests indicate the presence of nitrates, nitrites, catalase and peroxidase, and substances capable of reducing methylene blue in the exudate water of maize, oats, and timothy. The exudate water was a good medium for the growth of certain bacteria. Hydrogen ion concentration was near the neutral value but increased with age of plants. It is concluded that the exuded water may be a good medium for the growth of soil bacteria.—*Lewis Knudson.*

MINERAL NUTRIENTS AND SALT RELATIONS

4073. BRONFENBRENNER, J. Effects of electrolytes on the rate of inactivation of bacteriophage during precipitation. Proc. Soc. Exp. Biol. and Med. 23: 187. 1925.—NaCl has an inactivating effect upon bacteriophage, while salts with divalent cations have an even more pronounced effect. When monovalent and divalent salts are mixed in suitable proportions they antagonize each other.—*M. M. Brooks.*

4074. HARRIS, J. ARTHUR. The accumulation of chlorides in the leaf tissue fluids of Egyptian cotton with the march of the season. Proc. Soc. Exp. Biol. and Med. 22: 415-417. 1925.—The results indicate an increase in the magnitude of the chloride concentration of the plant as a whole with the advance of the season in the case of the Egyptian type of cotton, but conclusions are questionable in the case of the upland plants.—*M. M. Brooks.*

4075. HIBBARD, P. L. A rapid method for demonstrating the effects of plants on a culture solution. Science 62: 515-516. 1925.—A method by means of which qualitative or quantitative demonstrations may be made after a few hours growth of wheat seedlings in solutions of single salts.—*C. J. Lyon.*

4076. HIBBARD, R. P., AND S. GERSHBERG. The salt requirements of Marquis wheat in water cultures for the vegetative phase of development. Michigan Agric. Exp. Sta. Tech. Bull. 64. 1-28. Fig. 1-7. 1924.—This bulletin considers the vegetative phase, beginning with the 6th week and continuing until the flowers began to appear. The salts used were KH_2PO_4 , $\text{Ca}(\text{NO}_3)_2$, and MgSO_4 , in 21 different solutions all of osmotic concentration of 1 atmosphere and arranged in the well-known "triangular" system, the extremes being 6 parts of the one salt solution to 1 part of each of the other 2. Shive's 5:2:3 solution was used as control. The 440 seedlings, 5 to a jar, were grown in the solution previously found to be the best (5:1:2) and on rotating tables to give similar light and temperature conditions. The most uniform groups of 5 out of the 88 jars of seedlings were selected and duplicate series of 21 jars of 5 plants each were grown in the 21 different culture solutions, with the addition of the controls in the 5:2:3 Shive's solutions. The total average transpiration per jar of 5 plants for the 4 weeks for the duplicate series combined was 3799.5 gm., the average length of tops 87.7 cm., and of the roots 28.8 cm. The average dry weight of tops was 11.9331 gm. and of roots 0.6805 gm. The average dry weight of the whole plant was 12.6088 gm. as compared with 8.9582 gm. for the checks given in Shive's 5:2:3 solution. The best cultures for dry weight of tops were those clustered at the high magnesium part of the triangle and the poorest in the low magnesium portion. The same general region, with scattered exceptions, embraced the best cultures in respect to dry weight of the roots. The length of the tops was quite variable, showing a coefficient of variation of $18.2\% \pm 0.0603$. The plants averaged 3.01 tillers per plant for the 42 jars while the controls in Shive's 5:2:3 solution averaged only 2.1 per plant.—*Ernst A. Bessey.*

4077. KAMMEYER, HANS F. Stimulierungsversuche an Einjahrsblumen. [Stimulation experiments with annuals.] Gartenwelt 28: 543. 1 fig. 1924.—Ornamental pumpkins, *Impatiens balsamina* and *Dimorphotheca* were used. Seed were kept 3 hours in water and in a solution of 1.5% MgCl_2 and 1.5% MgSO_4 . After a few days it could be demonstrated that seed treated with the above mentioned salts germinated far better than those treated with

water only. It could be especially observed on the balsams. It is claimed that the differences in growth could be observed throughout the entire summer.—*J. C. Th. Uphof.*

4078. LLOYD, FRANCIS E. The cobalt sodium hexanitrite reaction for potassium in plant cells. *Flora* 118-119: 369-385. *Pl.* 5. 1925.—The cobalt-sodium-hexanitrite method for determining the localization of potassium in living cells is found inadequate. The position of the precipitate depends on various conditions, such as the local entrance through portions of the wall which permit of more rapid diffusion than elsewhere, the absorption of the reagent by cellulose and mucilaginous walls, and the difficulty of washing out the reagent from certain positions. The method, however, is of value as applied to various tissues. The author agrees with Weevers that there is no evidence of a definite localization of potassium in the cytoplasm; the salt is found chiefly in the vacuoles. It was not found either in the chloroplasts or the nucleus.—*A. G. Stokey.*

4079. MACALLUM, A. B. The purpurin method of localizing calcium. *Science* 62: 511. 1925.—The introduction of this method was attributed to the writer by Sampson (see following Entry) but it was first advanced by Grandis and Mainani in 1900 (*Arch. Ital. Biol.* 34: 73).—*C. J. Lyon.*

4080. SAMPSON, MYRA M. Conditions of validity of Macallum's microchemical test for calcium. *Science* 62: 400-401. 1925.—The test for calcium in plant or animal cells as reported by A. B. Macallum (*Ergeb. Physiol.*, 7: 611. 1908) was to apply an alcoholic solution of purpurin. This test is found to give a satisfactory specific color reaction for calcium "if the medium from which the cells are transferred or in which they are killed is alkaline in reaction." (See also preceding entry).—*C. J. Lyon.*

4081. SIDORINE. Le fer et la nutrition isolée. [Iron and nutrition.] *Rev. Gén. Bot.* 37: 337-359. 1925.—The partial absorption of iron and sulphur in the experiments on nutrition under control depended on 3 factors, namely: (1) The structure of the vascular system of corn, (2) the peculiarities of circulation of solutions in the vascular system, and (3) peculiarities of assimilation of iron and sulphur.—*J. C. Gilman.*

METABOLISM (GENERAL)

4082. ANONYMOUS. [Rev. of: ONSLOW, MURIEL WHELEDALE. The anthocyanin pigments of plants. 2d. ed. viii + 314 p. University Press: Cambridge, 1925.] *Nature* 116: 672. 1925.

4083. ARCHBOLD, H. K. Chemical studies in the physiology of apples III. The estimation of dry weight and the amount of cell wall material in apples. *Ann. Botany* 39: 109-122. 3 fig. 1925.—The dry weight (about 16%) obtained by heating 36 hours at 100°C. is lower than that obtained by calculation from the density of the juice. The difference decreases during storage and is attributed to the presence of a volatile higher alcohol which decreases with time. Methods of determining the amount of cell wall material are described. In apples stored at 1°C. the percentage of dry weight and of cell-wall material remains remarkably constant; at 3°C. it decreases definitely with time.—*W. P. Thompson.*

4084. ASAHINA, YASUHIKO, UND AKIRA FUJITA. [The constitution of rutaecarpin.] (*Japanese.*) *Jour. Pharm. Soc. Japan* 1921: 863-869. 1921.—The constitution of the alkaloids evodiamin ($C_{15}H_{17}N_3O$) and rutaecarpin ($C_{15}H_{13}N_3O$) of the fruit of *Evodia rutaecarpa* Benth. and Hook. is discussed.—*C. G. Deuber (from author abst. in Japanese Jour. Chem.).*

4085. BAKHUYZEN, H. L. VAN DE SANDE. Starch grains of wheat considered as partially dehydrated amylose. *Proc. Soc. Exp. Biol. and Med.* 23: 195-197. 1925.—Starch grains were ground up so that they became 60% soluble in cold water. A basis for an explanation of the properties and structure of wheat starch grains is given by assuming that the alternate layers are made up of α and β amylose. Methods of increasing and decreasing hydration are given.—*M. M. Brooks.*

4086. BECKING, L. B. The identity of the pigments in the purple bacteria. *Proc. Soc. Exp. Biol. and Med.* 22: 523-527. 1925.—A number of groups of bacteria having a peculiar purple color were measured by the photospectroscope, with evidence of a close relation between the pigments.—*M. M. Brooks.*

4087. CHARAUX, CAMILLE. Sur le mélilotoside, glucoside générateur d'acide coumarique,

extrait des fleurs de *Melilotus altissima* Thuil. et de *Melilotus arvensis* Wallr. [Melilotoside, a glucoside yielding coumaric acid, extracted from the flowers of *M. altissima* and *M. arvensis*.] Bull. Soc. Chim. Biol. 7: 1056-1059. 1925.—The alcoholic extract of the flowers is dissolved in water, shaken out with ether and clarified with neutral lead acetate. Upon saturation with lead subacetate, the glucoside is precipitated as a lead salt which is decomposed with H_2S , freed of lead, and evaporated to a syrup, when the glucoside crystallizes out. Its properties are described. It is hydrolyzable by emulsin or dilute acids, yielding 1 molecule each of coumaric acid and glucose. The name melilotoside is proposed for the new glucoside.—*Joseph S. Caldwell.*

4088. CHARAUX, CAMILLE, ET PIERRE DELAUNEY. Sur la présence du loroglossoside (loroglossine) dans le *Listera ovata* R. Br. et l'*Epipactis palustris* Crantz et sur quelques nouvelles réactions de ce glucoside. [Presence of loroglossin in *L. ovata* and *E. palustris* and some new reactions of this glucoside.] Bull. Soc. Chim. Biol. 7: 1148-1150. 1925.—The glucoside was obtained from the 2 species named in amounts varying considerably with the age of the plants. Several new color reactions characteristic of loroglossin are described. Roots of *Listera ovata* develop an odor resembling vanillin during desiccation, but the aromatic principle is not vanillin and has not been identified. It is apparently identical with that already observed in many of the 23 species of orchids (9 genera) now known to contain loroglossin.—*Joseph S. Caldwell.*

4089. COSTER, CH. De zetmeel-vet-omzetting in stam en takken vancenige tropische en Europeesche houtsoorten op Java. [The starch-fat transformation in trunk and branches of certain tropical and European timber species in Java.] Handel. v/h Derde Nederland.-Indisch Natuurwetensch. Congres, Buitenzorg, Sept. 25-28, 1924. 6 p. Buitenzorg, [1925?].—Microchemical differentiation of fat from other materials was found extremely difficult for the fats present in trees, and conclusions were drawn only on the basis of repeated tests by different methods. Of 61 tropical species investigated, fats were found only in 12: *Pinus merkusii*, *Podocarpus imbricata*, *Myrica javanica*, *Poinciana regia*, *Melia azedarach*, *Ilex pleiobrachiata*, *Hibiscus tiliaceus*, *H. schizopetalus*, *Gossampinus heptephylla* (*Bombax malabaricum*), *Ceiba pentandra*, *Sterculia foetida*, *Millingtonia hortensis*. The names of the other species examined are given. Of 23 trees from the temperate zone grown at high elevation in West Java, the following contained fat: *Pinus canariensis*, *P. halepensis*, *P. australis*, *Taxodium distichum*, *Cupressus fastigiata*, *Chamaecyparis obtusa*, *Salix babylonica*, *Populus fastigiata*, *Castanea sativa*, *Berberis vulgaris*, *Morus alba*, *Magnolia obovata*, *Pirus malus*, *Prunus triflora*, *Buxus sempervirens*, *Ilex latifolia*, *Syringa vulgaris*. Six trees contained no fat: *Quercus pedunculata*, *Fagus sylvatica*, *Alnus maritima*, *Prunus puddum*, *P. persica*, *Crataegus pyracantha*. No periodic variation was found in fat content during the course of the year in either local or introduced species except in *Salix babylonica*, in which the fat content was greatest in July to August, the period of least growth. An attempt to induce fat formation by refrigeration of 8 tropical and 10 introduced species failed.—*Carl Hartley.*

4090. DELAUNEY, PIERRE. Sur les glucosides de plusieurs espèces d'Orchidéés indigènes. [The glucosides of several species of indigenous Orchids.] Bull. Soc. Chim. Biol. 7: 1144-1147. 1925.—The paper continues previous work (Bull. Soc. Chim. Biol. 5: 238. 1921; 5: 298. 1923) in which it has been shown that loroglossoside (loroglossin) is present in *Loroglossum hircinum* and 16 other orchids of the genera *Orchis*, *Cephalanthera*, *Epipactis* and *Ophrys*. Employing the same methods, *Goodyera repens* and *Limodorum abortivum* were found to yield small amounts of the same glucoside. The amounts of material of *Orchis ustulata* and of *Spiranthes autumnalis* available were so small that only qualitative tests of the nature of the glucose could be made, but these were positive. The presence of loroglossin in the 4 additional species named is therefore regarded as established. All of the 4 species contain loroglossigenol, the mother substance of loroglossin.—*Joseph S. Caldwell.*

4091. DOWELL, C. T., AND W. C. FRIEDEMANN. A chemical study of broom corn and broom corn silage. Oklahoma Agric. Exp. Sta. Bull. 135. 1-7. 1921.

4092. EMERIQUE, LISE. Recherches sur la valeur alimentaire de l'inuline et des légumes contenant ce glucide. [Studies on the nutritive value of inulin and of vegetables containing this carbohydrate.] Ann. Physiol. et Physicochim. Biol. 1: 123-131. 1925.—Mice utilized

only about half of pure inulin, but when guinea pigs were given Jerusalem artichokes, either raw or cooked, and with or without addition of pure inulin, there was complete assimilation of all laevorotatory substances.—*Joseph S. Caldwell.*

4093. ENGLIS, D. T., R. T. DECKER, AND A. B. ADAMS. The preparation of raffinose from cotton seed meal. *Jour. Amer. Chem. Soc.* 47: 2724-2726. 1925.

4094. FERNBACH, A., M. SCHOEN, ET S. HAGIWARA. Quelques observations sur la formation des gommages par les bactéries. [Some observations on the formation of gums by bacteria.] *Compt. Rend. Soc. Biol.* 92: 1418-1419. 1925.—*Leuconostoc dextranicus* is able to produce a dextrosan from the dextrose which was made by this organism from the hydrolysis of sucrose. This is similar to the production of the levulosan by *Gommobacter*, previously reported. Strange to say the gum can be made only by sugars which the bacteria themselves have produced. This points to the production of what may be called "nascent" sugars.—*Oran Raber.*

4095. FREIBERG, GEORGE W. Observation on the carbohydrate metabolism of acetone-butyl alcohol fermentations. *Proc. Soc. Exp. Biol. and Med.* 23¹: 72-73. 1925.—Chemical equations are given for some of the stages in the fermentation of acetone-butyl alcohol.—*M. M. Brooks.*

4096. FUNK, CASIMIR. Essai de classification des vitamines. [Classification of the vitamins.] *Bull. Soc. Chim. Biol.* 7: 1017-1019. 1925.—The author proposes 2 groups, the vitamins properly so-called, which contain N and are decomposed by alkalies, and the vitasterins or vitasterols, which contain no N and are resistant to alkalies. These are again subdivided, the former into B, or antineuritic vitamin; C, or antiscorbutic; D, or vitamin stimulating the growth of yeast; and P, (??) or antipellagra vitamin. The vitasterols are A, or antixerophthalmic vitasterol; E, or antirachitic; and F, (?) or reproductive vitasterol.—*Joseph S. Caldwell.*

4097. HALL, ALFRED J., AND C. P. WILSON. The volatile constituents of Valencia orange juice. *Jour. Amer. Chem. Soc.* 17: 2575-2584. 1924.—The water-soluble volatile constituents of Valencia orange juice are ethyl alcohol, acetone, acetaldehyde, and formic acid. Those that are less soluble are an olefin alcohol, an amyl alcohol, phenylethyl alcohol, and esters of formic, acetic and caprylic acids. "Geraniol and terpineol were indicated but not positively identified."—*J. M. Brannon.*

4098. HAYNES, DOROTHY. Chemical studies in the physiology of apples. I. Changes in the acid content of stored apples and its physiological significance. *Ann. Botany* 39: 77-96. 8 fig. 1925.—Variation in the acidity of apples at ordinary temperatures and in cold storage is shown in tables. The effect of storage at low temperature is (1) to decrease the rate of loss of acid, and (2) to increase fluctuations of acid content due to differences of sample. The rate of loss follows a logarithmic law. Departures from this law are usually correlated with incidence of internal break down, the first apparent effect being a more rapid rate of loss. High acidity and low rate of loss are conditions favoring breakdown, and this would be lessened if apples were not exposed to low temperature until the acid content were reduced. It is probable that rate of loss of acid is largely determined by the rate at which sugar is oxidized and that it is the rate of production of acid which is differently affected in different cases.—*W. P. Thompson.*

4099. HERISSEY, H. Sur la composition chimique de l'Aspérule odorante. Extraction et propriétés d'un nouveau glucoside, l'asperuloside. [The chemical composition of *Asperula odorata*. Extraction and properties of a new glucoside, asperuloside.] *Bull. Soc. Chim. Biol.* 7: 1009-1016. 1925.—Nine kilos of the aerial parts, collected late in May, yielded 4.5 gm. of crude, air-dry glucoside, obtained by extracting the material with boiling alcohol, distilling off the alcohol in presence of CaCO_3 , replacing with water, and repeatedly extracting the aqueous solution with acetic ether. The extract was concentrated to small volume and an equal volume of pure ether added. The glucoside crystallized out and was purified by solution in acetic ether, filtering hot through animal charcoal, and recrystallizing. The solubility in various reagents, melting point and other constants, indicate that the glucoside has not previously been isolated; it is named asperuloside. On hydrolysis with H_2SO_4 or emulsin, it yields 43-44% of d-glucose and a very dark brown water-insoluble substance, asperuligenol, which has not been studied in detail but which is considered to be responsible for the black-

ening which the plant undergoes during drying. There is also present in the plant a 2nd glucoside, not yet isolated and purified, which yields coumarin on hydrolysis or treatment with emulsin.—*Joseph S. Caldwell.*

4100. HEUKELEKIAN, H., AND SELMA A. WAKSMAN. **Carbon and nitrogen transformations in the decomposition of cellulose by filamentous fungi.** Jour. Biol. Chem. 66: 323-342. 1925.—The authors found that cellulose is completely decomposed by *Trichoderma* sp. and *Penicillium* sp. giving CO₂ as the only waste product. No intermediary products are left in the medium. A considerable part of the C of the cellulose is reassimilated by these organisms and built into protoplasm. It has been conclusively shown that the C evolved as CO₂ and the C assimilated by the fungi account for nearly all of the C of the cellulose decomposed. The divergencies are small and are due to experimental error. The C and N assimilated by the organisms show a definite relationship to one another. The organisms prefer ammonia to nitrate as a source of N. This is assimilated and transformed into microbial protoplasm. A direct correlation is thus found between the amount of cellulose decomposed and the amount of N transformed into an insoluble organic form.—*Geo. B. Rigg.*

4101. HOAGLAND, RALPH, AND GEORGE G. SNIDER. **Vitamin A in beef, pork and lamb.** Jour. Agric. Res. 31: 201-221. Pl. 1, fig. 1-23. 1925.—The authors determined the vitamin A content of commercial samples of high-grade beef, pork, and lamb by means of feeding tests with young albino rats. The muscle tissue from each class of animal was first dried at a temperature not exceeding 60°C. and the dried tissue was used as the sole source of vitamin A in an otherwise adequate ration. The samples of beef examined were found to be relatively poor in vitamin A but when used to the extent of 50% or more in a ration, practically normal growth was obtained. The samples of pork tested proved to be poorer in vitamin A than the samples of beef. Several samples of lamb were fairly well supplied with vitamin A, 20% of dried flesh furnishing sufficient of this vitamin for normal growth; the other samples had about the same value as the beef.—*Ralph Hoagland.*

4102. IRVING, LAURENCE, AND L. B. BECKING. **Observations on the metabolism of the corallines.** Proc. Soc. Exp. Biol. and Med. 22: 162-166. 1924.—The total available excess base for coralline metabolism was assumed to be 0.0013 N. Lime deposition by the corallines was measured in the light and in the dark. The light reaction is closely expressed by a monomolecular reaction equation; the dark reaction can be duplicated by E. Schutz's law in which $\frac{dx}{dt} = \frac{a^2}{2x}$ —*M. M. Brooks.*

4103. KENDALL, ARTHUR ISAAC. **The effect of insulin upon the metabolism of certain bacteria.** Proc. Soc. Exp. Biol. and Med. 23: 62-64. 1925.—A number of different types of bacteria were inoculated into broth containing glucose and glucose plus insulin; there was no apparent effect upon the rate or intensity with which the different types of bacteria utilized glucose for energy.—*M. M. Brooks.*

4104. KONDO, HEISABURO, AND SHUNICHI SATA. [On the constitution of the matrin. I.] (Japanese.) Jour. Pharm. Soc. Japan 1921: 659-679. 1921.—The constitution of matrin, the chief alkaloid of the root of *Sophora flavescens*, is discussed.—*C. G. Deuber (From author abst., Japanese Jour. Chem.).*

4105. KONDO, HEISABURO. [On the constitution of the matrin. II.] (Japanese.) Jour. Pharm. Soc. Japan 1921: 1047-1069. 1921.—The relations of matrin to matridin, desoxymatrin and bismatridin are described.—*C. G. Deuber. (From author abst., Japanese Jour. Chem.).*

4106. KONDO, KINSUKE. **On the constituents of Pelvetia Wrightii Yendo.** (Japanese.) Jour. Chem. Soc. Japan 42: 259-274. 1921.—Methyl-pentosan and pentosan as well as galactan and mannite were found to be the carbohydrates of *Pelvetia Wrightii* Yendo. As fucose and arabinose have been found to be formed on hydrolysis with HCl, the methylpentosan is regarded as fucosan and the pentosan as araban. Fucose gave 28.6% of its weight of methylfurfurol on boiling with HCl.—*C. G. Deuber (From abst. by K. Matsubara, Japanese Jour. Chem.).*

4107. LEVENE, P. A., AND B. J. C. VAN DER HOEVEN. **Concentration of the growth-promoting principle obtained from yeast. (Vitamin B.)** Science 62: 594. 1925.—A mate-

rial has been obtained which was active for the white rat in daily doses of 0.00008 gm.—*C. J. Lyon.*

4108. LEVY, R., GEORGES TEISSIER, ET RENÉ WURMSER. Étude des pigments d'une Bactériacée sulfureuse; *Chromatium Okenii* Perty. [The pigments of a sulphur bacterium, *Chromatium Okenii*.] Ann. Physiol. et Physicochim. Biol. 1: 298-311. 1925.—The organism was obtained in quantity by filtering and centrifuging the water of a basin in the garden of the École Normale Supérieure. Extraction with 80% methyl alcohol removes the green pigment with a small amount of the red, but the latter precipitates out quantitatively when the solution is allowed to stand in the dark. Treatment with absolute methyl alcohol, ethyl alcohol, acetone, chloroform or carbon disulphide, after previous removal of the green pigment, extracts the red one. The method adopted for separating the 2 pigments was successive extraction with 80% methyl alcohol and with acetone. The red acetone extract, previously called bacteriopurpurin, is a carotinoid giving positive reactions to all the tests for this group. The green pigment appears to be identical with the bacteriochlorine of Molisch and is probably a lipochrome. Extraction of the organisms with physiological salt solution yields a preparation regarded as identical with that existing in the living cells, which has all the reactions of a globulin and appears to be a chromoprotein made up of a globulin with the carotinoid linked up as a prosthetic group. The aqueous saline solution extracts another chromo-protein which appears to be a globulin in combination with the green lipochrome pigment.—*Joseph S. Caldwell.*

4109. LORENZINI, G. Caractères différentiels entre les vitamines des aliments et les vitamines isolées. [Differences between vitamins as found in foods and the purified products.] Compt. Rend. Soc. Biol. 92: 151-153. 1925.—The vitamins in extracted juices have properties different from those exhibited by purified and isolated vitamins. The crude vitamins are characterized by unstable colloids, large granules, slight Brownian movement, negative cataphoresis, and slow dialysis while the "isolated" material shows stable colloids, small granules, very pronounced Brownian movement, positive cataphoresis, and rapid dialysis. These differences may account for the differences found in their physiological effects.—*Oran Raber.*

4110. MAIGE, A. Remarques au sujet de l'intérêt physiologique des variations du seuil de condensation amylogène dans les cellules végétales. [The physiological interest in variations of the threshold of starch condensation in plant cells.] Compt. Rend. Soc. Biol. 92: 1385-1387. 1925.—This is a general discussion of the complexity of the question of the threshold of condensation. The endodermis differs from the bark and from the pericycle in that when branches arise in the bark or roots in the pericycle the endodermis takes no part whatever in these growth processes but shows an entirely different physiological behavior.—*Oran Raber.*

4111. MURAYAMA, YOSHIATSU, AND TAKEYOSHI ITAGAKI. [The constituents of the roots of *Rumex crispus* L. var *japonicus* Makino.] (Japanese.) Jour. Pharm. Soc. Japan 1921: 951-959. 1921.—The dried roots of this *Rumex* yielded 0.12% frangula emodin and 0.5% chrysophanic acid, part of which was free and part combined with sugar.—*C. G. Deuber (From author abst., Japanese Jour. Chem.).*

4112. MURAYAMA, YOSHIATSU, AND TAKEYOSHI ITAGAKI. [The ethereal oil of *Nepeta japonica*, Maxim. I.] (Japanese.) Jour. Pharm. Soc. Japan 1921: 786-790. 1921.

4113. POLONOVSKI, MICHEL, ET FRÉDÉRIC MORVILLES. Sur la formation d'amidon dans les plantes aux dépens de l'arabinose. [The formation of starch in plants from arabinose.] Compt. Rend. Soc. Biol. 92: 443-445. 1925.—Beans and potatoes which had been grown in the dark until all trace of starch in the young shoots had disappeared were then placed in a nutrient solution to which arabinose was added. Although the plants were not able to live, the veins gave a positive test for starch, indicating that the plant can make starch to a certain extent from pentoses.—*Oran Raber.*

4114. RANDOIN, MME. L., ET H. SIMONNET. Essai de définition des vitamines. [The definition of vitamins.] Bull. Soc. Chim. Biol. 7: 1020-1023. 1925.—After stating the properties of the various vitamins, the authors define vitamins as substances not yet chemically or physically identified, which the animal organism is incapable of synthesizing, which are ob-

tainable in certain fractions of the undetermined portions of the food, and which, in exceedingly small amounts, are indispensable to the vital phenomena during the course of development of the animal or in its adult condition, and whose absence is responsible for characteristic disturbances of nutrition.—*Joseph S. Caldwell.*

4115. RUŠNEV, PETER. Ueber die Chemie des Lignins. [The chemistry of lignin.] *Centralbl. Gesam. Forstw.* 49: 281-294. 1923.—The work of various investigators on the origin, composition, and determination of lignin in wood is summarized as follows: Lignin is probably synthesized from the pentosans and hexosans, and is probably in chemical rather than merely mechanical combination. It is not a uniform substance, but in woods of conifers probably consists of α - and β -lignin in the ratio 2:1. It may be a derivative of coniferylalcohol; in conifers, α -lignin probably consists of 2 molecules of coniferylaldehyde, and β -lignin of 1 molecule of coniferylaldehyde and 1 of caffeic acid. The lignin content of wood varies within rather narrow limits (broad-leaved species 20-26%, conifers 28-29%). The so-called lignin color reactions are not lignin reactions, but merely show the degree of purity of cellulose. Quantitative determination by the methoxyl method is impossible. A long list of references is cited.—*W. N. Sparhawk.*

4116. SANDO, CHARLES E. Plant coloring matters. *Jour. Amer. Pharm. Assoc.* 14: 299-307. 1925—This paper is supplemental to an article by Wurdack (*Jour. Amer. Pharm. Assoc.* 13: 307-315; 399-406. 1924) on natural coloring matters. The subject matter is discussed under the following headings: (1) Plastid pigments—chlorophylls and carotinoids; (2) soluble sap pigments—flavone and anthocyanidin derivatives; (3) importance of chlorophylls and carotinoids; (4) the value of natural coloring matters as dyestuffs; (5) pigmentation in connection with problems of inheritance; (6) possible relation of plant pigments to disease resistance.—*Author.*

4117. SANDO, CHARLES E. The isolation and identification of quercetin from apple peels. *Jour. Agric. Res.* 28: 1243-1245. 1924.—One of the first indications of scald in apples is the appearance on the greener portions of the fruit of a typical brown discoloration. A possible relation between the suspected occurrence of a flavonol pigment in the skin and scald led to the isolation and identification of this pigment. The particular flavonol coloring matter, which was found to occur in McIntosh apple peels, proved to be quercetin, $C_{15}H_{10}O_7$. It was identified by means of its penta-acetyl derivative and by combustion of the purified pigment itself. It is suggested, as a basis for further investigation, that quercetin, or its glucoside which has not been isolated, may be the chromogenic substance which is responsible for the formation of brown pigment in the peels of scalded apples.—(*Author's Summary.*)

4118. SHEDD, O. M. The relation of some chemical constituents to the grades of Kentucky tobacco. *Kentucky Agric. Exp. Sta. Res. Bull.* 258. 31-58. 1925.—A study of the content of certain chemical constituents in 254 samples of various grades of Kentucky burley and dark tobaccos was conducted in order to determine if distinct differences could be found that would distinguish them as clearly as their physical properties. Analyses were made of burley and dark tobacco of the 1920 and 1921 crops, using samples of good, medium, and common of the various grades. Total N, nicotine, and NO_3 N were determined in the individual samples; also crude ash, Si, P, K, Ca, and Mg in the composite samples representing the good and common of each grade. The detailed results are given in a series of 19 tables. The good division of any grade usually contained a larger percentage of nicotine than the common. Nitrogen and NO_3 were more variable but in the majority of instances the good carried the larger percentages of these constituents. In burley the fillers usually contain the largest percentage of N and nicotine and the smokers the smallest. In dark tobacco the leaf usually has the largest percentage of N, nicotine and NO_3 , and the trash the smallest. Burley contained larger percentages of N and NO_3 and smaller percentages of nicotine than dark tobacco. Burley leaf which was badly infected with leaf-spot diseases (1920 crop) contained a considerably smaller percentage of nicotine but a larger percentage of N than that which was less diseased.—*W. D. Valleau.*

4119. SPONSLER, O. L. X-ray diffraction patterns from plant materials. *Science* 62: 547-548. 1925.—The pioneer work on starch has been extended to other plant materials, including bast fibers, cotton, tracheids and sclerenchyma cells. A table is given of the spac-

ings found for several substances, all of which are of the hexose type. The dimensions of the spacings are uniform and their magnitude shows that the unit of the lattice structure is a group of atoms, possibly the C_6 group.—*C. J. Lyon.*

4120. THOMAS, PIERRE, ET ROSA IMAS. Recherche des pentoses dans les glucosides végétaux. [Determination of pentoses in vegetable glucosides.] *Compt. Rend. Soc. Biol.* 92: 300-302. 1925.—A method is described for determining whether a glucoside contains a pentose. This qualitative test is a specific one for pentose glucosides and is given neither by glucose-glucosides nor by pentose derivatives.—*Oran Raber.*

4121. ULTÉE, A. J. Cerotinsäure in Milchsäften. [Cerotic acid in latex.] *Bull. Jard. Bot. Buitenzorg III.* 7: 444-445. 1925.

4122. WAGNER, E., K. F. MEYER, AND C. C. DOZIER. Studies on the metabolism of *B. botulinus* in various media. XXVI. *Jour. Bact.* 10: 321-412. 1925.—*Bacillus botulinus* induces in a 2% solution a slow evolution of gas, and a considerable accumulation of ammonia, amino and volatile acids with little change in the reaction of the medium. The addition of glucose influences the metabolic activity of the organism as indicated by a large and rapid evolution of gas, a slight ammonia production and the development of an acid reaction. The maximum chemical changes which take place in glucose Parke-Davis pepton cultures inoculated with vegetative cultures occur in the first 48 hours of incubation. The acidity is probably the most important growth-limiting factor. In plain pepton cultures the greatest chemical changes take place between the 48th and 96th hours of incubation; the exhaustion of specific food substances is probably responsible for the cessation of growth. The presence of glucose in 2% pepton cultures of *B. botulinus* Type B may inhibit the formation of a highly potent toxin. The addition of gelatin to a pepton solution increases the nutritional properties of the medium. It apparently does not increase the buffer value. The activity of *B. botulinus* in aminoids solution indicates that albumoses and proteoses are not necessary for either growth or toxin production. Toxin production is intimately connected with the proteolytic activity of the culture. The volatile acid present in a 10-day-old meat culture has been identified as a mixture of valeric, butyric, and acetic acid in the proportion of 3:7:2; as a rule, volatile acids of higher molecular weight predominate. A comparative analysis of "old stock" and "recently isolated" cultures of *B. botulinus* in meat media and milk indicates that very slight differences exist in their metabolism. The biochemical activities of *B. sporogenes* and *B. histolyticus* are similar to those of *B. botulinus*. "Vibrion septique" causes only a slight degradation in the nitrogen constituents of the medium. *B. tetani* grows slowly but produces, on prolonged incubation, profound chemical changes in meat media. A fermentation for 21 hours of a medium of low nitrogen content by *B. welchii*, causes sufficient loss in biological value to prevent a subsequent vigorous growth of *B. botulinus*. Evidence is presented which shows that fermentation of media by *B. welchii* for the removal of muscle sugar induces considerable nitrogeous changes. A greater number of viable organisms is usually present in sugar-free, double strength veal-infusion 1% Difco pepton than in the same medium with added glucose. The gelatinolytic potency of the supernatant fluid from the glucose-containing culture is less than that of the sugar-free culture, but the latter also maintains a higher level of growth. Milk possesses only a moderate biological value for *B. botulinus*. Milk cultures of *B. botulinus* contain a casein-coagulating, as well as a casein-digesting, enzyme. A solution of casein digest having approximately the same total nitrogen content as milk possesses high biological value for *B. botulinus* and *B. tetani*. The latent period of the *B. tetani* culture was much longer than that of either strain of *B. botulinus*. *B. botulinus* produces a larger quantity of volatile acids of higher molecular weight than *B. tetani*.—*Authors.*

4123. WILLIMOTT, STANLEY G., AND FRANK WOKES. The vitamin content of cortex limonis. B. P.—Preliminary note. *Pharm. Jour.* 115: 164-168. 2 fig. 1925.—The chief result so far recorded is that "cortex limonis," B. P., contains appreciable amounts of vitamin. Had this material been vitamin-free, the animals would probably all have died within 3 weeks of being restricted to it as a source of vitamin, since the basal ration did not contain any vitamin. Actually, growth was continued steadily up to the 50th day in the case of the males, when the average weight was 76% of the normal; the females, after growing slowly for

36 days, were practically at a standstill. Hence, the curves show that, at the level at which it was fed, the lemon peel contained considerable amounts of vitamin, although not sufficient to ensure continuance of the maximum growth rate. Although the females normally grow at a definitely slower rate than the males, it is difficult to account entirely for the wide divergence in growth and well-being observed between the male and female "lemon peel" rats, especially since the females did not respond appreciably on doubling the supply of lemon peel, or on adding the known fat-soluble A requirement.—*E. N. Gathercoal*.

4124. WORKANY, JOSEF. Ueber die Kohlehydrate der Tuberkelbazillen. [Carbohydrates of the tubercle bacillus.] *Zeitschr. Tuberkulose* 42: 185-189. 1925.—A chemical analysis of the carbohydrates in tubercle bacilli from broth cultures was made after the fats had been removed. Percentages are based on the dry weight of the bacteria after they had been washed several times with boiling water to remove all traces of the culture medium. The following results were obtained: (1) Carbohydrates resistant to dilute mineral acids, consisting of cellulose, 7.1%; (2) carbohydrates easily hydrolysed, consisting of (a) furfural-yielding substance, 4.15%, (b) glycogen, 4.1%. No chitin, gum (pectin), hemicellulose, or difficultly hydrolysable pentosans were found. The literature is reviewed and the methods used in testing for each substance are given.—*Louise Dossdall*.

4125. YANAGISAWA, HIDEKICHI, AND HAJIME KONDO. [Iodine as a catalyzer in the preparation of the cumarins.] (Japanese.) *Jour. Pharm. Soc. Japan* 1921: 498-502. 1921.—Iodine was found to be much more efficient as a catalyst than zinc chloride in the preparation of cumarin from raw cumarin.—*C. G. Deuber (from author abst., Japanese Jour. Chem.)*.

4126. ZAJDEL, ROSE, ET CASIMIR FUNK. La synthèse des vitamines par les levures. [Synthesis of vitamins by yeast.] *Compt. Rend. Soc. Biol.* 92: 1527-1528. 1925.—Cultivated yeasts are not able to grow on a purified substrate from which all of vitamin D has been removed. Wild yeasts, however, can grow on such a medium and their extract increases the growth of the cultivated yeasts grown without the vitamin, thus leading to the conclusion that wild yeasts are able to synthesize their own vitamin D.—*Oran Raber*.

METABOLISM (NITROGEN RELATIONS)

4127. ARCHBOLD, H. K. Chemical studies in the physiology of apples. II. The nitrogen content of stored apples. *Ann. Botany* 39: 97-108. 2 fig. 1925.—The percentage of N varies from 0.02 to 0.08 of fresh weight, according to the variety. Individual apples of the same variety vary as much as 40%. The determined N is regarded as a measure of the protoplasm present. It is in the form of protein; only a trace can be extracted in soluble form, and it decreases during storage. High N value is associated with low acidity and high rate of respiration.—*W. P. Thompson*.

4128. BELGRAVE, W. N. C. Studies on Hevea latex. 3. Proteins and allied bodies. *Malayan Agric. Jour.* 13: 154-159. 1925.—The distribution of nitrogen among the proteins, albumoses, amino-acids and amides was investigated and found not to indicate any special function for the lower products. The constitution of the proteins and amino-acids was also investigated.—*R. E. Holtum*.

4129. ROWMAN, H. H. M., AND MARTIN A. YEE. Crystals of vitamin B from the Mung bean. *Proc. Soc. Exp. Biol. and Med.* 22: 228-231. 1925.—A method of preparation of vitamin B in crystal form from the Mung bean is described and the properties of the crystals are given.—*M. M. Brooks*.

4130. COONS, G. H., AND L. J. KLOTZ. The nitrogen constituents of celery plants in health and disease. *Jour. Agric. Res.* 31: 287-300. 1925.—It was found that in celery leaves affected with *Cercospora Apii* and *Septoria Apii* there is a lower percentage of total N in the necrotic than in the healthy tissue. Nitrites are present in the diseased material. A comparison of the nitrogenous compounds present shows in percentage of total N, greater NH_3 , greater humin, greater protein, less hydrolyzable, less acid amide, less basic, and less non-protein N in the diseased than in the healthy tissues. These results are explained as due to decomposition of the host tissue by the parasite in a simple food relation.—The existence of a similar chemical picture in the spinach mosaic and in the cabbage disease of unknown nature studied by Jodidi and his associates does not warrant the assumption that the spinach mosaic

is of parasitic nature, nor can the cabbage disease be diagnosed on the basis of mere chemical analyses as a true mosaic. The importance of N metabolism of parasitic fungi is stressed as a possible explanation of selective parasitism and as a point of attack in immunological research. A bibliography dealing chiefly with methods of analysis is appended.—*G. H. Coons.*

4131. GROENEWEGE, J. *Onderzoekingen over de rol van het eiwit der Hevea latex.* [Investigations on the role of the albumen of *Hevea latex*.] Mededeel. Alg. Proefsta. Landb. [Nederland.-Indië] 20. 1-25. 1924.—A discussion of the significance of albumen in connection with coagulation, ripening, and permeability and drying. The role of enzymes in coagulation is also discussed.—*Carl Hartley.*

4132. JOHNSON, TREAT B., AND ROBERT B. COGHILL. *Researches on pyrimidines. CHIL.* The discovery of 5-methyl-cytosine in tuberculinic acid, the nucleic acid of the tubercle bacillus. Jour. Amer. Chem. Soc. 47: 2838-2844. 1924.—This pyrimidine was isolated from the nucleic acid of the tubercle bacillus as picrate. It makes the 4th pyrimidine found to function in the changes going on in the living cell. The other 3 are cytosine, uracil, and thymine.—*J. M. Brannon.*

4133. JONES, D. BREESE, AND FRANK A. CSOKA. *Proteins of the cotton seed.* Proc. Soc. Exp. Biol. and Med. 22: 226-227. 1925.—The method of extraction of proteins is stated. Two globulins and a possible nucleic acid were obtained. Descriptions of these are given. Identification of glutelin and a nucleo protein and a physical-chemical analysis of different protein fractions are under way.—*M. M. Brooks.*

4134. KLEIN, ANIELA, CASIMIR FUNK, BENJAMIN HARROW, AND LOUIS PINE. *The nutritive value of the various layers of the wheat and corn kernel.* Proc. Soc. Exp. Biol. and Med. 23: 20-21. 1925.—The milling fractions of wheat and corn were analyzed to determine their content of total protein, gliadin, globulin and glutenin.—*M. M. Brooks.*

4135. KOMM, ERNST. *Eiweissbildung bei Tier und Pflanze.* [Protein formation in animals and plants.] Naturwiss. u. Landw. Abhandl. u. Vorträge 5: 1-62. F. P. Datterer & Cie. Freising-München, 1925.—The introduction contains a brief review of the hypotheses concerning the structure of proteins and their formation. The 2nd part deals with the formation of the protein "building stones"—the amino acids. The various hypotheses are presented and the author concludes that in all probability these "building-stones" may be formed in many different ways. The remaining 2 sections deal with protein formation and transformation in animals and plants, respectively. As the plants alone can construct amino acids and proteins from inorganic materials the animal must obtain these materials from the plants. While animal and plant proteins are very similar, yet the animal body must resolve the plant proteins into their component "building-stones" and reconstruct these into the protein molecules peculiar to its own constituent cells. These disintegrating and rebuilding processes are brought about by specific enzyme action. The author suggests that protein formation takes place in somewhat the following way: Through the catalysis of enzyme action amino acids are joined together to form polypeptides. Further enzyme action induces the conversion of these polypeptides, with additional loss of water, into anhydrid rings of the structure of two 5-diketopiperazine or polymers of this form. These anhydrid rings then join themselves together by a satisfying of their bonds, to form the complex protein molecule.—*P. D. Strausbaugh.*

4136. KONDO, KINSUKE. [The proteins of polished rice. I. The refractive indices of solutions of the proteins found in non-glutinous and glutinous rice.] (Japanese.) Jour. Chem. Soc. Japan 42: 828-862. 1921.—The author separated proteins from non-glutinous and glutinous rice raised in Etchu, and found that the refractive indices of their solutions in diluted alkali may be expressed by the following equation: $n - n_1 = a x c$, where n_1 is the refractive index of the solvent, n that of the solution, c the percentage of protein in the solution, and a a constant, of the value, 0.0017496 ± 0.0000013 for the protein of non-glutinous rice, and 0.0016345 ± 0.0000018 for the protein of glutinous rice. In respect to percentage composition, in the protein of non-glutinous rice the C and H content was lower and the N, S, and O content higher than in that from glutinous rice.—*K. Matsubara (courtesy of Japanese Jour. Chem.).*

4137. LEININGEN, [WILHELM]. *Über die Stickstoffaufnahme verholzender Pflanzen.* [The consumption of nitrogen by woody plants.] Forstwiss. Centralbl. 47: 673-683. 1925.—

This is a discussion of recent investigations on the nitrate consumption of trees, and related problems, including the problems of indicator plants, soil acidity, and microbiological activity in rendering N available for plants. It is pointed out that nitrates may be practically lacking in forest soils in spite of active nitrification, because the trees may take up the nitrate as soon as formed and convert it into protein. The author's studies have shown that the nitrate content of the surface vegetation on forest soils (as determined by reaction to diphenylamin- H_2SO_4 solution) varies widely for individuals of a given species and even for different parts of the same plant, and for the same part of the plant at different seasons. Certain species (*Sambucus nigra*, *Atropa belladonna*, and *Rubus* spp.) generally show a strong reaction on practically all sites and at all seasons, while others react for a short time after being fertilized with nitrates, but after a few months cease to react.—*W. N. Sparhawk.*

4138. LEWIS, J. H., AND H. G. WELLS. The immunological properties of alcohol-soluble vegetable proteins. IX. The biological reactions of the vegetable proteins. *Jour. Biol. Chem.* 66: 37-48. 1925.—There is a "wheat group" and a "corn group" of prolamines, the members of each group being chemically and immunologically similar to each other.—*Geo. B. Rigg.*

4139. LEWIS, JULIAN H., H. GIDEON WELLS, WALTER F. HOFFMAN AND ROSS AIKEN GORTNER. An immunological and chemical study of the alcohol-soluble proteins of cereals. *Proc. Soc. Exp. Biol. and Med.* 22: 185-187. 1924.—The prolamines were isolated from wheat, durum, emmer, spelt, einkorn, rye, oats, barley, corn, kefir, teosinte and sorghum and subjected to chemical and immunological study. The evidence suggests that the prolamines may be grouped into "wheat" and "corn" groups.—*M. M. Brooks.*

4140. LIPMAN, C. B., AND L. J. H. TEAKLE. Symbiosis between *Chlorella* sp. and *Azotobacter chroococcum* and nitroxy fixation. *Jour. Gen. Physiol.* 7: 509-511. 1925.—Mixed cultures of *Chlorella* and *Azotobacter* showed a large relative gain in the amount of nitrogen fixed. The *Azotobacter* in described as using the carbohydrate produced by *Chlorella* as a source of energy for nitrogen fixation.—*O. L. Inman.*

4141. MIYAKE, KOJI, AND SYUHEI SÖMA. Further studies of the nature of nitrification. *Jour. Biochem. Tokyo* 1: 123-129. 1922.—From experiments with the soil and ammonium sulphate the authors confirmed the view that the process of nitrification as a whole is an autocatalytic mono-molecular chemical reaction.—*S. Kakiuchi. (Japanese Jour. Chem.)*

4142. PLIMMER, ROBERT HENRY ADERS. The action of nitrous acid upon amides and other "amino"-compounds. *Jour. Chem. Soc. (London)* 127: 2651-2659. 1925.—An investigation was made of the behavior of several N compounds when treated by the Van Slyke method for the estimation of amino N. Amides and urethane do not react with HNO_2 in the presence of acetic acid. Both react quantitatively in the presence of approximately 2 N HCl. The formation of N in the presence of HCl is not due to hydrolysis of the amide. Urea reacts quantitatively with HNO_2 in the presence of acetic acid. Biuret reacts with 1 N atom in presence of acetic acid, with 2 N atoms in presence of small amounts of HCl, with 3 N atoms in presence of 2 N HCl. Guanidine, creatine, and arginine (excepting its primary alpha-amino-group) require HCl for reaction with HNO_2 . In the case of creatinine, addition of HCl diminishes the volume of N evolved. The relation of these facts to the question of the molecular grouping of atoms in these compounds is discussed.—*F. E. Denny.*

4143. R., E. [Rev. of: MOLLIARD, MARION. *Nutrition de la plante. 4. Cycle de l'azote. (Plant nutrition. 4. The nitrogen cycle.)* xv + 319 p. (Encyclopedie scientifique: Bibliothèque de Physiologie et de Pathologie végétales.) Gaston Doin: Paris, 1925.] *Nature* 116: 354-355. 1925.

4144. VAN SLYKE, DONALD D., AND WILLIAM ROBSON. An unidentified base among the hydrolytic products of gelatin. *Proc. Soc. Exp. Biol. and Med.* 23: 23. 1925.—A short description and analysis of the substance is given.—*M. M. Brooks.*

4145. VICKERY, H. B. Some nitrogenous constituents of the juice of the alfalfa plant. VI. Asparagine and the amino acids in alfalfa. *Jour. Biol. Chem.* 65: 657-664. 1925.—Serine and alanine were found in the juice of the alfalfa plant. So far as known, they had not previously been found in plant juices. Asparagine is abundant in the juice of alfalfa.—*Geo. B. Rigg.*

4146. WILEY, H. W. [Rev. of: BAILEY, C. H. *The chemistry of wheat flour.* New

York. 1925.] Science 62: 511-515. 1925. (See also Bot. Absts. 14, Entry 4012.) The Chemical Catalog Co., Inc.

4147. YOSHIMURA, KIYOHISA. [The nitrogenous compounds in egg-plant (*Solanum melongea*, L.).] (Japanese.) Jour. Chem. Soc. Japan 42: 16-22. 1921.—The following bases have been obtained from 60 kilos of fresh fruits of egg-plant: trigonelline (hydrochloride) 1.5, imidazolyethylamine (chloraurate) 0.2, adenine (hydrochloride) 1.0, choline (hydrochloride) 2.0 gm.—(From abst. by K. Matsubara, *Japanese Jour. Chem.*).

4148. YOSHIMURA, KIYCHISA, AND KEE CHENFON. [The putrefaction products of polished rice.] (Japanese.) Jour. Chem. Soc. Japan 42: 22-37. 1921.—The following bases have been separated from the putrefaction products of polished rice, 2 kilos of rice being used, in each case: imidazolyethylamine (chloraurate), (I) 0.8, (II) 0.2 gm.; putrescine (hydrochloride) 0.7, 2.0; amyl amine (I) small quantity, (II) not distinct; ammonia (I) 5.5, 5.2.—By titration with NaOH, the acids produced from 100 gm. of rice in 10 days at room temperature (30-32°C.) were estimated as follows: volatile (as acetic) acid, 0.6671 gm.; non-volatile (as lactic) acid 0.6085 gm.—K. Matsubara (*Japanese Jour. Chem.*).

METABOLISM (ENZYMES, FERMENTATION)

4149. ANONYMOUS. [Rev. of: BAYLISS, W. M. *The nature of enzyme action*. 5th. ed. viii + 200 p. Longmans Green and Co.: London, 1925.] Nature 116: 744. 1925.

4150. FABRE, RENÉ, ET R. FROSSARD. Influence de la réaction du milieu sur la digestion papainique. [Effect of reaction of medium on digestion by papain.] Compt. Rend. Soc. Biol. 92: 59-60. 1925.—Using carefully purified papain on hog fibrin, it was determined by several different methods that the optimum for the action of papain is pH 7 or neutrality. Both slight alkalinity and acidity diminished the action.—Oran Raber.

4151. GRATIA, ANDRÉ, ET SARA DATH. Moisissures et microbes bactériophages. [Bacteriophagic molds and bacteria.] Compt. Rend. Soc. Biol. 92: 461-462. 1925.—Report is made of the bacteriophagic action of *Streptothrix* and of a variety of *Penicillium glaucum*.—Oran Raber.

4152. GREY, EGERTON CHARLES. The synthetic side of fermentation. Cairo Sci. Jour. 12¹¹⁵: 121-133. Fig. 3. 1925.—Yeast not only breaks down organic foods but also builds up compounds, as do all living things. In micro-organisms it is hard to isolate such compounds because of the short life of the organism. Enzymes are known to build up as well as tear down, and the author believes that enzyme action is also reversible in the case of yeasts because of the rapidity with which it builds up starch from sugars. He thinks that all chemical changes in living matter, that is, all metabolism, is due to enzymes. When the organism is young and healthy, synthetic action predominates, and when decomposition or what used to be called fermentation begins, it means that the organism is approaching death.—The author placed 0.6 gm. (dry weight) of *Bacillus coli* in a glucose solution, after first emulsifying the organisms in a solution containing 0.5% K₂SO₄ and 0.1% MgSO₄. Chalk was added to maintain neutrality. At the end of 24 hours 7.4 gm. of starch had been formed.—During the 12th to 24th hours 70% of the sugar consumed was converted into starch. Other experiments of a similar nature reveal the fact that as long as the bacteria are increasing rapidly in number there is a rapid production of starch, but when they begin to decrease in number no starch is produced. Methods are given for extracting the starch from the bacteria.—W. Carlton McQuiston.

4153. HEINICKE, A. J. Factors influencing catalase activity in apple-leaf tissue. New York [Cornell] Agric. Exp. Sta. Mem. 62: 1-19. 1923.—A method of preparing apple-leaf tissue for catalase tests is described and the details of the determinations are given, with evidence regarding their dependability. The influences of agitation, ineffective neutralization, concentration of solution, strength of H₂O₂, and interval between preparation and determination, are indicated. The catalase activity shown by leaves from twigs that have been standing in water is greater than that shown by the same leaves before the twigs are removed from the tree. Wilting of the tissue reduces the power to decompose H₂O₂. A relatively high catalase activity is shown by preparations of leaves from trees growing in good soil, from those receiving clean cultivation, and from heavily pruned or nitrogen-fertilized trees.

in sod. On the other hand, the activity is relatively low in preparations of leaves from trees growing in poor, sandy, or non-cultivated land receiving no fertilizer, and from trees that have been ringed, or otherwise injured in such a way as to reduce vegetative activity. The results suggest that the catalase test may serve as a rather sensitive indicator of the nutritive condition, and as an early measure of responses of the apple to cultural conditions or treatments which otherwise could not be measured for many months.—*Author*.

4154. HEINICKE, A. J. Catalase activity in dormant apple twigs: its relation to the condition of the tissue, respiration, and other factors. New York [Cornell] Agric. Exp. Sta. Mem. 74: 1-33. 1924.—A method of preparing apple-bark tissue for catalase determination is described and the details of the determination are given, with evidence regarding their dependability and with a discussion of the factors influencing the rate of catalysis. The mathematical significance of small differences in the results can be established by the method used. The catalase activity of various woody tissues, such as xylem, inner and outer bark, buds, bud shoulders, callus tissue, and the apical and basal parts of a twig, is shown, also the influence of various cultural methods, such as sod, ringing, and application of nitrate fertilizers. In general the data seem to afford a basis for the suggestion that the presence of growth-producing substances favors catalase activity, while substances tending to inhibit vegetative activity have a retarding influence on the decomposition of H_2O_2 by bark tissue. It is recognized that the catalytic power of the preparation is influenced by many physical and biochemical factors, so that the method followed in this study does not exactly determine the amount of catalase present in the tissue. However, it is believed that this does not seriously detract from the usefulness of the catalase test as an indicator of the physiological responses of apple-tree tissue to cultural treatments or conditions. Data regarding the CO_2 production by twigs from trees receiving different treatments indicate that there is no consistent relation between respiratory intensity and catalase activity. This fact, however, is not taken to indicate that catalase activity is therefore without metabolic significance.—*Author*.

4155. LEPKOVSKY, S., E. D. HART, E. G. HASTINGS, AND W. C. FRAZIER. The effect of fermentation with specific microorganisms on the vitamin C content of orange and tomato juice. Jour. Biol. Chem. 66: 49-56. 1925.—It is probable that the destruction of vitamin C in masses of fermenting plant tissue is to be referred to the O_2 still retained in the mass.—*Geo. B. Rigg*.

4156. LOEPER, M., ET A. MOUGEOT. Les eaux minérales bicarbonatées carboniques ont-elles une action activante sur les amylases? [Have carbonated mineral waters an activating action on amylases?] Compt. Rend. Soc. Biol. 92: 569-571. 1925.—Mineral waters such as Vichy, Bourboule, etc., have a pronounced activating action on salivary and pancreatic amylases as compared with ordinary water. This has been called by H. Roger a "zymosthenic" action.—*Oran Raber*.

4157. MOUGEOT, A., ET V. AUBERTOT. Eaux minérales bicarbonatées et activité de la sucrase de la levure de bière. [Bicarbonated mineral waters and the activity of sucrase from beer yeast.] Compt. Rend. Soc. Biol. 92: 1504-1506. 1925.—Although the activating or "zymosthenic" effect of mineral waters on amylases seems to be dependent upon the mineral content of the water, the effect on the sucrase studied was only one of H-ion concentration.—*Oran Raber*.

4158. NAYLOR, N. M., MABLE SPENCER, AND MARGART HOUSE. The preparation and properties of amylase from germinated wheat and rye. Jour. Amer. Chem. Soc. 47: 3037-3039. 1925.—The authors find that amylase obtained from wheat and rye compares favorably with that obtained from malt.—*J. M. Brannon*.

4159. NECHELES, H. A convenient apparatus for the determination of ferment action. Proc. Soc. Exp. Biol. and Med. 23: 243-244. 1925.

4160. PETROVANU, GUNTZA. L'action de l'eau oxygénée sur quelques groupes de microbes. Catalases microbiennes. Phénomène d'autolyse. [The action of hydrogen peroxide on certain groups of bacteria. Bacterial catalases. Autolysis.] Compt. Rend. Soc. Biol. 92: 459-460. 1925.—A preliminary note.

4161. RECORD, SAMUEL J. Lapachol. Tropical Woods 1: 7-9. 1925.—Lapachol ($C_{15}H_{14}O_3$) is a crystalline substance of a golden yellow color, which gives a pink color-reac-

tion with 1% NaOH. It occurs in the vessels of the heartwood of *Avicennia* and in several species of Bignoniaceae, especially *Tecoma* and *Tabebuia* spp. of South and Central America and at least 1 other genus in Madagascar. "The presence of lapachol in a wood of normal structure may be taken as fairly conclusive evidence that the material belongs to the Bignoniaceae."—*W. N. Sparhawk*.

4162. ROSENTHAL, L. Microbes bactériolytiques (Lysobactéries). [Bacteriolytic bacteria or lysobacteria.] *Compt. Rend. Soc. Biol.* 92: 78-79. 1925.—The genus *Tyrothrix* will dissolve either living or killed cultures of the cholera vibrio, typhoid bacillus, *B. coli*, *B. proteus*, *Staphylococcus* spp. and *Diplococcus* spp. For such bacteria the names "bacteriolytic microorganisms" or "lysobacteria" are proposed.—*Oran Raber*.

4163. ROSENTHAL, L. Mécanisme de l'action des lysobactéries. [Mechanism of the action of lysobacteria.] *Compt. Rend. Soc. Biol.* 92: 472-474. 1925.—The lytic action of the lysobacteria, especially of *Tyrothrix scaber*, is due to the production of enzymes, especially diastases.—*Oran Raber*.

4164. SMORODINTZEFF, J. A., ET A. N. ADOFF. Les tampons dans l'étude des protéases. 1re communication. Etude comparative des méthodes de mesure du pH dans le dosage de la pepsine par la méthode de Gross. [Buffers in the study of the proteases. I. Comparative study of the methods of measuring pH in the estimation of pepsin by Gross' method.] *Bull. Soc. Chim. Biol.* 7: 1060-1067. 1925.—Gross' method for the quantitative estimation of proteases is based on the fact that the products of the digestion of casein are not precipitated by sodium acetate. The authors have followed the course of digestion of casein with natural and artificial gastric juice, determining pH by both electrometric and colorimetric methods. Methyl violet as indicator gives results as accurate as the electrometric method. There is no change in pH during digestion of casein by natural or artificial gastric juice; hence a solution of casein in HCl is fairly well buffered.—*Joseph S. Caldwell*.

4165. SMORODINTZEFF, J. A., ET A. N. ADOFF. Importance des tampons dans l'étude des protéases. 2e communication. Influence des tampons sur la digestion de la caséine par la pepsine. [Importance of buffers in study of proteases. II. Importance of buffers in the digestion of casein by pepsin.] *Bull. Soc. Chim. Biol.* 7: 1068-1070. 1925.—Three buffer solutions: HCl + glycocoll (pH = 1.14), HCl (pH = 1.2), and HCl + citrate (pH = 1.14 and 1.274) were added in various amounts to digestions of casein with pepsin and natural gastric juice. There was neither retardation nor acceleration of the rate of digestion.—*Joseph S. Caldwell*.

4166. SMORODINTZEFF, J. A., ET A. N. ADOFF. Les tampons dans l'étude des protéases. 3e communication. L'influence des tampons sur le pH pendant la digestion de la caséine d'après la méthode de Gross. [Buffers in the study of proteases. III. Influence of buffers on the pH during digestion of casein by Gross' method.] *Bull. Soc. Chim. Biol.* 7: 1154-1157. 1925.—The addition to a digestion of a volume of water equal to $\frac{1}{10}$ the volume of the digestion, or of $\frac{1}{2}$ its volume of citrate (pH = 1.14) did not alter the pH of the mixture; $\frac{1}{2}$ volume of water increased the pH slightly. There was no subsequent change in pH in the course of the digestion. Results with natural and with artificial gastric juice were identical in these respects.—*Joseph S. Caldwell*.

4167. TOMODA, YOSHINORI. [Preparation of glycerine by fermentation.] (Japanese.) *Jour. Chem. Indust. Tokyo* 24: 240-252, 305-321. 1921.—Raw sugar molasses and sugar mash from rice were found to be most suitable for preparation of glycerine by fermentation. The sugar mash from potato did not give satisfactory results. In general, better yield of glycerine was obtained as the sugar mashes contained a greater amount of non-sugar extract. Saké- and wine-yeasts gave better results than beer- and pressed-yeasts. The effect of sodium sulphite and of sodium carbonate upon the yield of glycerine was studied.—*T. Makino* (Courtesy Japanese Jour. Chem.).

4168. YAMAZAKI, EIICHI, AND MASUO KAWAKAMI. [Glucis-isomerase, a new enzyme accelerating the birotation of glucose.] (Japanese.) *Jour. Chem. Soc. Japan* 42: 793-828. 1921.—It was found that the birotation of glucose at pH 4.7 was accelerated by Taka-diastase. As this action was stopped by heating the solution of enzyme to 80°C., the existence of an enzyme which might be called glucis-isomerase, seemed probable. Glucis-isomerase is considered to be an enzyme which does not change the final equilibrium of the substrate.—*C. G. Deuber*. (From abst. by M. Katayama, Japanese Jour. Chem.).

4169. YAMAZAKI, EIICHI, AND NOBUO YAMADA. [The chemical reaction in the system of Taka-diaxase and maltose.] (Japanese.) Jour. Chem. Soc. Japan 42: 707-761. 1921.—With amorphous maltose the initial velocity of the reaction with Taka-diaxase was much greater than with crystalline maltose under the same conditions, the velocity gradually decreasing in the 1st, and rapidly increasing in the 2nd case. This difference is ascribed to the fact that a minute quantity of impurity contained in amorphous maltose partially protects the enzyme from the inhibiting action of maltose, and it requires a certain time until the inhibiting action appears in full display, whereas, in the case of crystalline maltose, diaxase is inhibited instantaneously by maltose, and recovers its catalytic action as maltose is gradually decomposed. The partial irreversibility of enzyme action is ascribed to the nature of the adsorption layer on the boundary of colloidal particles of the enzyme.—C. G. Deuber (From abst. by M. Katayama, Japanese Jour. Chem.).

METABOLISM (RESPIRATION, AERATION)

4170. LEGENDRE, R. Les moyens de priver d'oxygène un milieu biologique. [Ways of depriving a biological medium of oxygen.] Compt. Rend. Soc. Biol. 92: 1431-1432. 1925.—This is a brief discussion of the 4 standard ways of providing an O-free medium: (1) Replacement of the O by an inert gas such as H, (2) halting oxidations in the tissue by means of certain poisons, such as KCN, (3) absorption of O by means of potassium pyrogallate, and (4) use of boiled distilled water.—Oran Raber.

4171. MAYER, ANDRÉ, ET LUCIEN PLANTEFOL. Hydratation et respiration chez les mousses. [Hydratation and respiration in mosses.] Ann. Physiol. et Physicochim. Biol. 1: 239-280. 1925.—Continuing earlier work (Idem 1: 64-84. 1925.) in which it was shown that the rate of water absorption depends upon the vapor tension of the air, the authors study the relation between degree of hydration and intensity of oxidation in *Hypnum triquetrum*. The technique for drying the material over H_2SO_4 in vacuo and for measuring the gas exchanges of the material is described in detail. The oxygen absorbed per hour is practically a constant for material containing water equal to 478 to 159% of its dry weight, but falls off with smaller amounts of water present in the tissues. With 413 to 478% of water imbibed by the material, 0.05-0.09 cc. of O is absorbed per gm. of water per hour; with 110 to 122% of water, O absorption equals 0.236-0.262 cc. per gm. of water; and with smaller percentages of water (31-19%) the absorption of O per gm. of water drops to 0.026-0.036 cc. per hour. There is thus a maximum rate of O absorption when water amounting to 100-150% of the dry weight of the tissue has been absorbed. The rate of oxidation is a function of the degree of imbibition regardless of the season of the year in which material is collected or of its content of stored food, but is much greater in plants containing large food reserves or those allowed to imbibe dextrose solution instead of distilled water. The oxidation rate returns to the same value after a lot of material is tested, dried, and allowed to regain its former water content. Anhydrobiosis is not a condition of absolute freedom from water nor of cessation of respiration, but of a reduction of oxidation proportional to the degree of desiccation of the tissues. In plants revived by water, oxidation increases in proportion to the amount added, up to a fairly definite limit.—Joseph S. Caldwell.

4172. SIERP, HERMANN. Untersuchungen über die Kohlensäureabgabe aus keimenden Erbsensamen. [The carbon dioxide given off by germinating peas.] Flora 118-119: 476-502. 1925.—This paper deals with a series of experiments to determine the factors affecting the amount of CO_2 given off by peas which have been soaked in water.—A. G. Stokey.

4173. WEBSTER, LESLIE T. Changes in virulence and growth characteristics of *Bacterium leprosepticum* following alterations in oxygen tension. Proc. Soc. Exp. Biol. and Med. 22: 139-141. 1924.—*B. leprosepticum* fails to multiply freely or to maintain certain characteristics associated with its virulence unless available O is mechanically limited or the O effect is minimized by the presence of peroxidase.—M. M. Brooks.

ORGANISM AS A WHOLE

4174. CRIST, JOHN W. Growth of lettuce as influenced by reaction of culture medium Michigan Agric. Exp. Sta. Tech. Bull. 71. 1-25. Fig. 1-3. 1925.—Using Grand Rapids

Forcing lettuce, both soil and water cultures were made under greenhouse conditions under different degrees of acidity of the medium. Maximum growth was obtained at pH 5.0, but the variety used showed a wide range of tolerance. The addition of lime to strongly acid soil beyond a small fractional part of the total "lime requirement" of the soil progressively reduced the plant's content of water and nutrient materials and thus diminished growth. It is suggested that this effect is brought about by the "effect of the calcium in decreasing the permeability of the plant membranes involved in the processes of absorption and translocation." The lime requirements of the soils decreased with the growth of the plants until towards the end of the vegetative period when they began increasing again.—*Ernst A. Bessey*.

4175. DEBORD, GEORGE G. Effect of dehydration upon the bacterial flora of eggs. *Jour. Agric. Res.* 31: 155-164. 1925.—Eggs dehydrated by the spray and vacuum-drum processes were studied. The grades of the eggs were commercial firsts, heated, and rots and spots. The count of the viable bacteria in freshly prepared dehydrated eggs varied, in general, with the quality of the raw product and the method of dehydration. The percentage of killed organisms increased as the total number of bacteria increased and varied with the type of organisms. The yolks showed usually a higher number of bacteria than the whites from the same whole eggs. In the greater number of experiments the decrease in the colon group was very large; the decrease in the lactose fermenters, as determined by the plate method, was decidedly smaller. Organisms of the colon type were predominant in the liquid product, while the aerogenes type was predominant in the product after drying. The organisms which survived the heating process in the good eggs were mainly spore-formers. Samples of the spray process egg were stored at 20°, at approximately 25° and at 37°C. for 10 months. The count of the good eggs remained practically the same, while the higher count eggs showed a general decrease during the storage period. An odor similar to rancidity developed in the eggs held at the various temperatures. This was most pronounced in rotten eggs held at 37°C. The odor which is characteristic of poor quality eggs is lost to some extent during the dehydration process.—*Author*.

4176. DEBORD, GEORGE C. Reaction to Gram's stain by certain spore-forming bacteria. *Proc. Soc. Exp. Biol. and Med.* 22: 397-398. 1925.—Positive correlation between Gram-positive bacteria and their ability to form spores is confirmed if young cultures are compared. Some cultures evidently alter their metabolism in this respect with age and become Gram-negative.—*M. M. Brooks*.

4177. GREAVES, J. E., AND D. H. NELSON. The influence of irrigation water and manure on the composition of the corn kernel. *Jour. Agric. Res.* 31: 183-189. 1925.—Corn grown on a highly calcareous soil with and without irrigation water and manure showed a decrease in the N content of the grain due to the manure. The ash, Ca, P and K content are increased due to irrigation water. All the constituents are greatly increased by manure. The increased ash constituents come from an increased supply of available plant food in the soil. Manure and irrigation water both increase the bacterial activities, which in turn increase the available plant food.—The increased Ca, K, and P and the narrower Ca:P ratio in the corn kernels grown with irrigation water makes such corn more valuable for human and animal nutrition than similar corn grown without irrigation water.—*J. E. Greaves*.

4178. HUDDLESON, I. FOREST. The comparative pathogenicity of several strains of *Bacterium abortus* (Bang). *Michigan Agric. Exp. Sta. Tech. Bull.* 55. 1-14. 1922.

4179. KRASNOW, FRANCES, HELEN B. RIVKIN, AND MARGARET L. ROSENBERG. Availability of synthetic media for streptococci. *Proc. Soc. Exp. Biol. and Med.* 23: 215-217. 1925.—Of 671 synthetic media tested, 441 permitted streptococci to remain viable through one or more transplants.—*M. M. Brooks*.

4180. REED, H. S. Recent work on physiology of citrus leaves. *California Citrograph* 10: 312, 336-337. 3 fig. 1925.—There is given a non-technical report of studies of the sap concentration of lemon leaves and its relation to time of pruning, "June drop," and certain extreme climatic conditions. Studies of the composition of citrus leaves and investigation looking to the causes of chlorosis and mottle leaf are also discussed.—*C. S. Pomeroy*.

4181. SCHMUCKER, TH. Beiträge zur Biologie und Physiologie von *Arum maculatum*. [Biology and physiology of *Arum maculatum*.] *Flora* 118-119: 460-475. 1 fig. 1925.—The

opening of the flower buds, brought about chiefly by light, occurs usually between 3 and 6 P.M. Experiments with the inflorescence throw doubt on the value of the spathe and other structures as pollination devices. Treatment with chloroform lowered and ether raised the temperature of the inflorescence. The following enzymes were found: Diastase, invertase, catalase, oxidase, a proteolytic enzyme, and an enzyme acting on glucose.—A. G. Stokey.

4182. SEELIGER, RUD. *Topophysis und Zyklophysis pflanzlicher Organe und ihre Bedeutung für die Pflanzenkultur.* [Evaluation of location and periodicity of organs of plants and their importance in plant cultivation.] *Zeitschr. Erforsch. Nutzpflanz.* 6²: 191-200. 1924.—The idea of uniformity and homogeneity which the peculiar homonymous organs and organ complexes of a plant, such as foliage leaves, buds, flowers and seeds, give us is deceptive. The place of origin "Topophysis," of an organ determines its value, as does also the time of its appearance, "Zyklophysis." Application of these principles may be made to the propagation and cultivation of plants. Shoots from the upper and outer parts of a plant are more fruitful than shoots from the inner and under parts, while the latter take root more rapidly and more extensively. If the flower shoots of certain plants are used for cuttings one obtains dwarf and richly flowering individuals; but if cuttings are made of strong leafy shoots, luxuriously growing plants, not flowering so readily, are obtained. In leaf propagation the position of the leaf upon the mother plant will determine the quality of the sprouts regenerated from it. Other relationships are mentioned.—W. J. Himmel.

4183. [SHAPOSHNIKOV, V., AND A. MANTEIFEL'.] Шапошников, В., и А. Мантейфель. *К. морфологии, физиологии и Биологии нового гриба Penicillium aernarium n. sp. в связи с лимоникислым Брожением.* [A morphological, physiological and biological study of *Penicillium arenarium* in connection with citric fermentation.] *Труды Научно-Химико-Фармацевтического Инст.* Выпуск [Trans. Sci. Chem.-Pharmaceut. Inst.] 5. 1-64. [Moscow] 1923.—A series of observations on the effect of chemicals on the growth and development of *Penicillium arenarium* indicate that the optimum temperature for normal development of the fungus is 42-48°C. When the medium contains only 0.05% N, growth is inhibited. Large concentrations of peptones, when applied in considerable quantities, also retard growth. The consumption of the citric acid formed by the fungus begins either when all the sugar has been used up, or when the citric acid has been accumulated in the presence of acids. In the presence of alkalis, citric acid production is greatly reduced. In a medium of 5% citric acid the fungus grows more rapidly than in one lacking the acid. The addition of even 2.88% of citric acid doubles the yield, not by its nutritive value but by its presence. Thus, an accumulation of this acid in the medium not only does not harm the fungus but even stimulates its growth. The production of citric acid is regarded as of benefit to the fungus in combating bacteria which may be competitors in the medium at the optimum temperature.—L. J. Pessin.

4184. [SHAPOSHNIKOV, V., AND A. MANTEIFEL'.] Шапошников, В., и А. Мантейфель. *К физиологии Bacillus acidificans longissimus (B. Delbrücki) В связи с возможностью использования его для промышленного получения молочной кислоты.* [Studies on the physiology of *Bacillus acidificans longissimus* in connection with the possibility of utilizing it for the industrial production of lactic acid.] *Труды Научного Химико-фармацевт. Инст.* Выпуск Научно-Технический Отдел В. С. Ч. X. 28: 1-23, 1923. [Trans. Sci. Chem.-Pharmaceut. Inst.] 7. 1-23. [Moscow] 1923.—*Bacillus acidificans longissimus* when grown on peptone media does not develop normally. The presence or absence of NH_4Cl , NaCl , or MgSO_4 in the media seems to have some effect on the development of the organism. It was found that a 1% concentration of NH_4Cl added to normal wort produces elongation of the organisms. The development of the organisms, however, does not show any marked changes. When the salt is added in concentrations beyond 2.5% the development is markedly inhibited. Similar concentrations of NaCl produce somewhat similar effects, while MgSO_4 does not inhibit development even at a concentration of 5%, and only at 12% does the development begin to show signs of weakening. The ability of the *B. acidificans longissimus* to form lactic acid does not depend apparently on the presence or absence of the salts, but the concentration of these salts seems to have a marked effect on its development, and it is the development that bears a direct relation to the fermentation process. It was found that at 0.0% concentration of NaCl added to normal wort,

the development was normal, and in 4 days the lactic acid yield was 1.16%; at 1%, normal development, and yield reduced to 1.08%. At 2.5% the development was considerably reduced, and the yield was reduced to 1.07, while at 5%, when the development was markedly inhibited and the forms were abnormal, the yield of lactic acid had fallen to 0.60%. Similar results were also obtained with MgSO_4 . The authors derive the conclusion that certain salts, which stimulate the development of the organisms, stimulate indirectly the yield of lactic acid. As a medium satisfactory for maximum yields they suggest an extract of the seeds of sunflower (from which the oils have been removed) made with 5% MgSO_4 , 20 cc.; glucose 10 gm.; chalk 5.5 gm.; and water 80 cc.—*L. J. Pessin*.

4185. WEISSE, A. *Über Änderungen der Blütenfarbe durch äussere Faktoren*. [Changes in flower color induced by external factors.] *Verhand. Bot. Vereins Brandenburg* 65: 27-36. 1923.—A comprehensive review of the literature on the subject of color changes in flowers induced by such external factors as light, temperature, and soil composition and conditions. The conclusion is that, while these factors bring about changes in colors of flowers, there is so much variability in the different species in this relation that no general statements can be made.—*H. L. Blomquist*.

GROWTH, DEVELOPMENT, REPRODUCTION

4186. FERNALD, EVELYN I. The inhibition of bud-development as correlated with the osmotic concentration of sap. *Amer. Jour. Bot.* 12: 287-305. 15 fig. 1925.—In potatoes, the sap concentration is greater in sprouts than in tubers; and in apical than in basal eyes of tubers giving rise to strong terminal shoots, though not in those sprouting irregularly. Environmental variations in the normal development of sprouts were found to be accompanied by changes in the osmotic concentrations of the different portions. An increase in the concentration of tuber sap just before sprouting was followed by a decrease after sprouting. In *Bryophyllum* stems in which the apical buds failed to inhibit growth of lower ones, the sap concentration in the apical portion did not exceed that in the lower. In shoots of privet and *Philadelphus* in which the terminal bud was actively growing, the upper portion had a higher sap concentration than the lower, but this difference decreased when the terminal portion ceased active growth. When stem growth ceased, sap concentration was relatively high in the leaves as compared with the stem. There is evidently a fairly close correlation between the osmotic concentration of a tissue and its tendency to inhibit growth of other tissues or to be inhibited by them.—*E. W. Sinnott*.

4187. FIGDOR, WILHELM. *Über experimentale hervorgerufene ascidienförmige Blätter von Bryophyllum calycinum* Salisb. [Experimental production of cup-shaped leaves in *Bryophyllum calycinum*.] *Flora* 118-119: 111-114. Pl. 1. 1925.—This is a preliminary report on the production of cup-shaped leaves by the cutting of wedges in the region of the midrib of young, vigorous leaflets of mature plants.—*A. G. Stokey*.

4188. HENRICI, ARTHUR T. The rate of spore formation in bacteria. *Proc. Soc. Exp. Biol. and Med.* 22: 197-199. 1924.—Logarithms of the number of vegetative cells and of the number of spores are plotted. Spore formation is initiated at the end of the active growth period. The concentration of cells alone is not the determining factor in spore formation.—*M. M. Brooks*.

4189. HILL, A. W. Vitality of dormant buds. *Ann. Botany* 39: 210-212. 1 fig. 1925.—A detached branch of a mulberry stood in a dry building for 6 years. It was then used as a prop with its lower end in the ground. The following year a dormant bud developed and has produced a healthy shoot 2 feet long.—*W. P. Thompson*.

4190. PORTERFIELD, W. M. A study of the growth rate of square bamboo. *Lingnaam Agric.* 3¹: 35-38. 1925.—The work of other writers is briefly discussed.—Measurements were taken on 3 culms of *Phyllostachys quadrangularis* over a period of more than a month. Warm moist days were found to be more favorable to smooth rapid growth than cold windy days.—A bibliography of 5 titles is added.—*Albert N. Steward*.

4191. SCHMITT, FRANCIS O., AND WILLIAM H. CHAMBERS. Fluid crystals and meristematic growth. *Proc. Soc. Exp. Biol. and Med.* 23²: 134-135. 1925.—A cytological investigation of cells of squash root tip was made to see whether any structures are present which might cor-

respond to the Golgi bodies of animal cells. Certain granules present were studied with the polarizing microscope and found to be uniaxial sphaero-crystals. In view of the rapid rate of growth of the meristematic cells, the suggestion is offered that the fluid crystalline bodies found in these cells may be important factors in this high rate of activity.—*M. M. Brooks.*

4192. SHWARTZMAN, GREGORY. The mechanism of shortening of the lag period in bacterial cultures containing certain food accessory substances. *Proc. Soc. Exp. Biol. and Med.* 22: 178-182. 1924.—The food accessory substances of tomato extract are all able promptly to "rejuvenate" *B. Shiga* and thus make it possible for this micro-organism to enter the phase of active multiplication very quickly after inoculation.—*M. M. Brooks.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

4193. ANONYMOUS. The transmission of excitation in plants. [Rev. of: BOSE, J. C. *Physiological and anatomical investigations on Mimosa pudica.* *Proc. Royal Soc. B*, 98: 690. 1925.] *Nature* 116: 376. 1925.

4194. SEUBERT, E. Über Wachstumsregulatoren in der Koleoptile von Avena. [Growth-regulating substances in the coleoptiles of Avena.] *Zeitschr. Bot.* 17: 49-88. 4 *Illus.* 1925.—Coleoptiles were decapitated, and the wounded parts covered with tiny cubes of agar placed at one side. If the agar was pure there was no curvature in growth. If the agar contained expressed juice of etiolated sprouts impregnated with neutral salts, sugars, or enzymes there was curvature toward the cube. At higher concentrations of expressed juice, malt extract, saliva, pepsin, or diastase, however, the curvature was negative. If the entire wound was covered with the cube, those substances or concentrations producing positive curvature were found to hinder growth, and conversely. It is considered that the materials used are growth-regulatory in their nature, either being enzymatic or affecting the enzymes of the plant. Decapitated plants provided with saliva-agar or malt-agar respond to light and gravity more weakly than normal plants, but more strongly than decapitated plants not so provided.—*P. B. Sears.*

GERMINATION, RENEWAL OF ACTIVITY

4195. GILLOT, PAUL. Observations sur la germination des graines de *Mercurialis annua* L. [Observations on the germination of seed of *Mercurialis annua*.] *Bull. Soc. Bot. France* 72: 139-153. 1925.—From the facts presented the author draws conclusions as follows: (1) *Mercurialis annua* may be classed among plants requiring high temperature for germination. (2) Germination tests are very delicate; their duration should not be limited to a few days but should be prolonged as much as possible. Germination proceeds better in moist soil than in other media, and better in the open air than in an incubator. (3) The seed germinate slowly and irregularly, and for any one crop of seed some years may be required to complete the germination of all. For the same lot the germination may vary, according to circumstances, from 3 to 90%. (4) The impermeability of the integument is only relative and does not seem to be the factor causing the irregularity in germination. (5) Stratification permits the rapid and complete germination of all living seed. (6) Seed of *M. annua* preserve their capacity for germination a long time, 12 years in the open air, and 20 years or less if deeply buried in the soil. (7) Their germinative capacity is least immediately after harvest, reaching a maximum the next year, then variable, and while viable many years, they gradually lose germinating power. (8) The first seed liberated from the capsules correspond to the 1st flowers. Such seed are the heaviest and best. (9) Sunshine exerts only a very slight action on the vitality of these seed.—*Henri des Gayets (translated).*

REGENERATION

4196. ADAMS, J. Adventitious shoots on hypocotyl of flax and tomato. *Bot. Gaz.* 78: 461-462. *Fig. 1.* 1924.—In the case of flax seedlings after cutting off the hypocotyl below the cotyledons, instead of death ensuing, growth took place by adventitious buds originating well below the callus of the cut end. The same phenomenon was rarely observed in the tomato.—*B. W. Wells.*

TEMPERATURE RELATIONS

4197. COBLENTZ, W. W. Frost flowers. *Amer. Forests and Forest Life* 31: 682-684. 9 fig. 1925.—This is an explanation of ice fringes on certain plants. It is thought that it is a physical phenomenon depending upon the presence of a great abundance of sap tubes which can supply moisture at a greater rate than it is carried away by evaporation and by air currents.—*Chas H. Otis*.

4198. DANIEL, LUCIEN. Variations de la résistance au froid chez des plantes greffées. [Variations in the resistance of grafted plants to cold.] *Rev. Bretonne Bot.* 1: 40-42. 1922.—In some instances the resistance to cold is increased by placing a less resistant scion upon a stock with greater resistance, and the reverse is also true. The author does not sympathize with the view that any definite relation obtains and he points out the error of generalizations concerning grafts.—*P. D. Strausbaugh*.

4199. POJARKOVA, ANTONINA. Winterruhe, Reservestoffe und Kalteresistenz bei Holzpflanzen. [Winter rest, reserve materials and resistance to cold in woody plants.] *Ber. Deutsch. Bot. Ges.* 17: 420-429. 1924.—This study deals with 14 species of *Ribes*, 4 of *Berberis*, 10 of *Lonicera*, 3 of *Amelanchier*, 11 of *Acer* and 3 of *Corylus*. It was found that those species in which a great quantity of starch is transformed into sugar manifest a profound dormancy, while those in which this transformation is insignificant have a very slight dormancy. The relation of the deepness of winter dormancy to the degree of resistance to cold that has been reported for plums is clearly shown only in the *Ribes* spp. Relatively cold-resistant species have a profound dormancy; those but little resistant are found to possess a very slight dormancy.—*P. D. Strausbaugh*.

4200. TANNER, FRED W., AND GEORGE I. WALLACE. Relation of temperature to the growth of thermophilic bacteria. *Jour. Bact.* 10: 421-437. 1925.—Growth curves were prepared for 3 thermophilic bacteria at 20, 37 and 55°C., in plain broth. At 20° the cultures showed less growth than at 37 or 55°. At 37° the period of maximum growth was reached in 16-30 days. At 55° growth was very rapid, the cells dying quickly after the period of active growth. Cells of thermophilic bacteria growing at 55° wear themselves out very quickly, the cultures becoming sterile. Warming of the medium to 55° before inoculation in every case shortened the lag phase. At 37° the lag phase was longer than at 55°. When both young and old cultures were used, the former began growing much more rapidly. The period of lag was about the same for both young and old cultures. At 20° the growth of the thermophiles was quite irregular. The lag phase was greatly prolonged. At 20° the bacteria grew slowly; the number soon reached a level where it remained constant for a long period.—*Author*.

RADIANT ENERGY RELATIONS

4201. ANCEL, P., ET P. VINTEMBERGER. Sur la radiosensibilité des cellules en caryoncinèse. [The radio-sensitivity of cells during mitosis.] *Compt. Rend. Soc. Biol.* 92: 986-988. 1925.—In the blastoderm of the chicken, cells during mitosis are not more sensitive to radium than when at rest.—*Oran Raber*.

4202. ANCEL, SUZANNE. Les rayons X appliqués sur des graines seches n'ont aucune influence sur l'époque d'apparition du germe. [Application of X rays to dry seed has no influence upon the time of germination.] *Bull. Soc. Bot. France* 72: 195-199. 1925.—The work reported shows that the exposure of dry seed to X rays of a strength varying from $\frac{1}{2}$ to 1000 H has no influence upon the swelling, nor does it influence at all the first mitoses, nor even affect the normal growth during the first 24 hours following the first evidences of germination. Such exposures effect diminution of activity or even death only after a certain time period following the first evidences of germination.—*Henri des Gayets (translated)*.

4203. BALY, E. C. C., AND E. S. SEMMENS. The selective photochemical action of polarized light. I. The hydrolysis of starch. *Proc. Roy. Soc. London B*, 97: 250-253. *Pl. 12-13*. 1924.—These experiments were suggested by the observation of stimulating effects of polarized light upon seed germination and flowering. Starches from potato, wheat, and maize were mounted in weak diastase solution. Grains exposed to polarized light, either from plane

mirror or nicol prism showed rapid hydrolysis, while controls in ordinary light and in darkness showed little or no change in the same length of time.—*P. B. Sears.*

4204. BRUYNOGHE, R., ET W. MUND. L'action du radium sur les microbes. [Action of radium on bacteria.] *Compt. Rend. Soc. Biol.* 92: 211-213. 1925.—When *Bacillus pyocyaneus* is exposed to radium emanation for 48 hours, the power to divide is lost, but all the other vital powers remain, including motility. Radium is thus seen to influence power of growth and reproduction and does not affect all powers equally.—*Oran Raber.*

4205. DANIEL, LUCIEN. Premières études sur l'action de l'éclairage unilatéral et des verres de couleur sur la tuberculisation de quelques plantes. [Action of unilateral lighting and of colored glass upon tuberisation.] *Rev. Bretonne Bot.* 1: 35-39. 1922.—This is a preliminary study in which the author describes the specific behavior of artichoke and Dahlia plants and also specimens of *Solanum Commersonii*, when grown in boxes into which light is admitted from one side only and likewise when the light is transmitted through red, green, blue, and white glass, respectively.—*P. D. Strausbaugh.*

4206. LACASSAGNE, A., ET A. PAULIN. Sensibilité différente des microbes aérobies au rayonnement β . [Variable sensitivity of aerobic micro-organisms to β rays.] *Compt. Rend. Soc. Biol.* 92: 61-62. 1925.—Using some 30 aerobic forms, it is concluded that the beta rays exercise a harmful action on all the forms, but variable according to species. It is thus possible to form a series from *Bacillus pyocyaneus* (most sensitive) at one end to the anthrax bacillus at the other. The toxicity of the beta rays is not a function of the size, rate of growth, toxic properties, color, or sporulation of the bacteria.—*Oran Raber.*

4207. LACASSAGNE, A., ET A. PAULIN. Séparation de certaines microbes aérobies grace à leur différence de sensibilité au rayonnement β . [Separation of different bacteria on their differences in sensitivity to β rays.] *Compt. Rend. Soc. Biol.* 92: 333-334. 1925.—In this way paratyphoid bacillus B has been separated from A, *Staphylococcus* from *Streptococcus*, and Friedlander's bacillus from *B. pyocyaneus*.—*Oran Raber.*

4208. MACHT, DAVID I., AND JUSTINA H. HILL. The influence of polarized light on yeast and bacteria. *Proc. Soc. Exp. Biol. and Med.* 22: 474-475. 1925.—A suspension of *Saccharomyces cerevisiae* was added to solutions of sucrose. Fermentation of sugar proceeded much more rapidly in polarized than in non-polarized light. Bacterial cultures also grow more profusely in polarized light.—*M. M. Brooks.*

4209. MUNERATI, O. Illuminazione artificiale notturna come mezzo per accelerare le fasi del ciclo dei vegetali. [Nocturnal artificial illumination as a means of accelerating plant development.] *Atti. R. Accad. Lincei Roma [Rendiconti Cl. Sci. Fis. Mat. e Nat.]* 33': 402-405. 1924.—Artificial light was used to illuminate wheat plants at night, thus shortening the period required to reach full development.—*F. M. Blodgett.*

4210. REISS, P. Sur l'excitation des bourgeons de plantes par les rayons X. [Stimulation of plant buds by X-rays.] *Compt. Rend. Soc. Biol.* 92: 984-986. 1925.—Buds of *Syringa vulgaris* are forced by X-rays if the radiation is not too strong; beyond the optimum the shoots are injured. The X-rays cause the cells to increase in length but do not favor mitosis. With strong radiation mitosis is completely stopped.—*Oran Raber.*

4211. RIVERA, V. Azione dei raggi X sopra i tumori vegetali. [Action of X-rays upon plant tumors.] *Rivista Biologia* 7: 449-465. 1 fig. 1925.—After E. F. Smith's work on the similarity of plant tumors to those of animals, some investigators have tried to cure both plant and animal tumors with radiations of the spectrum. Gosset, Magrou, Gutmann and Lakhovsky were the first to demonstrate that the X-rays have an evident action on experimental plant tumors. They used a radiation method of Lakhovsky's with electro-magnetic waves of 2 m. and a vibration of 150 million with 1 second exposure (Lakhovsky's radio-cell-oscillator). These authors demonstrated that the artificial tumors of *Bacterium tumefaciens* E.F.S. on *Pelargonium zonale* were completely destroyed by exposing the tumor to the rays for 3 hours the 1st day, and repeating the same exposure the 2nd day. The tumor continued to grow, but after the 16th day showed a beginning of necrosis and after the 45th was dried and detached from the plant. Rivera, after having obtained some artificial tumors with *Bact. tumefaciens* on *Ricinus* sp., tried treatment with Röntgen rays ("eritema" dose) but without good results.—In a series of tests of different durations of exposure Rivera obtained the best results with 4 M.A. 180 Kw, 40 cm. focal distance, without screen, and 25 minutes'

exposure. The tumors treated with X-ray ceased to grow after 4-10 days, becoming successively yellow, brown, and dry with cork formation. A cheek tumor on the same plant, protected from the X-rays by a thin lead plate, continued to grow. The author demonstrated that the action of X-rays, for the time exposure stated, kills the tissues of cancer cells but does not kill the normal tissues of the plant, an action similar to that exercised by them in the therapeutics of human cancer. There also exists the same latent period before growth begins after treatment. The author concludes that radiation has no direct action on the bacteria because cultures subjected to X-rays remained alive and were capable of producing tumors. He believes, therefore, that the action of the X-rays is confined to the tissues. Plants in which the inoculation wounds were X-rayed 5-24 hours after inoculation developed no tumors but the bacteria were found living in the tissues for 20 hours thereafter.—*Giulio Savastano*.

4212. VIDAL, D. Contribution à l'étude de l'influence des eaux radioactives sur la germination et le développement des plantes. Essais avec les eaux de Plombières. [Influence of radio-active waters on the germination and development of plants. Experiments with the waters of Plombières.] Ann. École Nation. Agric. Montpellier 18: 245-277. Fig. 1-7. 1925.—The treatment of seed of soft wheat, white mustard, and common vetch with the radio-active waters of Plombières had a stimulating effect upon the germination and upon the initial growth of the resulting plants. The treated seed seem to acquire a sort of potential vitality which, in the case of vetch, may be retained for even a month.—*F. F. Halma*.

4213. WILKES-WEISS, DOROTHY, AND CHARLES WEISS. Ultra violet rays in the purification of cultures of *Spirochaeta pallida*. Proc. Soc. Exp. Biol. and Med. 23: 87-91. 1925.—*Spirochaeta pallida* was not killed by the action of ultra violet light with an exposure of 75 seconds at close range; colon bacilli were destroyed. The time of exposure to light was varied.—*M. M. Brooks*.

TOXIC AGENTS

4214. ANTONIADIS, ET MAUME. Essais avec la cyanamide de calcium. [Tests with calcium cyanamid.] Prog. Agric. et Vitic. 74: 326-335. 1920.—The author reports upon the toxic effect of calcium cyanamid on pot cultures of wheat compared with checks and with NH_4Cl or $(\text{NH}_4)_2\text{SO}_4$ applied at the time of seeding. When applied 15 days before seeding, toxicity was lost. (See also this issue, Entry 4217.)—*E. L. Proebsting*.

4215. CHURCHMAN, JOHN W. Inhibition of sporulation by acid fuchsin. Proc. Soc. Exp. Biol. and Med. 23: 94-95. 1925.—Acid fuchsin prevents sporulation of *B. subtilis* and causes gradual death of the organism, while controls sporulate. The author states that this is more evidence against a teleological conception of sporulation as nothing more than a protective mechanism.—*M. M. Brooks*.

4216. KANO, NAOTSUNA. [Preservation of starch solution.] (Japanese.) Jour. Chem. Soc. Japan 42: 974-975. 1921.—Alcohol, ether, acetone, benzene or camphor gradually produce a milky precipitate in a starch solution. Phenol, chloroform, or glycerine very slowly produce milkiness, and after a few weeks begin to interfere with the iodine color reaction. Toluene keeps the solution transparent for more than 10 weeks. Naphthalene is effective for over 6 months, but colors the solution after a long time. Carbon bisulphide (1 drop in 50 cc. of 0.5% starch solution) or 2 N HCl (0.5 cc. in 50 cc. of 0.5% starch solution) keeps the solution quite transparent for over 8 months and even then does not interfere with the color reaction of iodine.—*M. Katayama* (Courtesy Japanese Jour. Chem.).

4217. SÉMICHON, L. La prétendue toxicité de la cyanamide. [The supposed toxicity of cyanamide.] Prog. Agric. et Vitic. 74: 516-519. 1920.—This is a reply to Antoniadis and Maume. (See this issue, Entry 4214.)—*E. L. Proebsting*.

4218. TRABUT, L. A propos de la toxicité de la magnésie. [The toxicity of magnesium.] Prog. Agric. et Vitic. 74: 444-445. 1920.

ELECTRICITY AND MECHANICAL AGENTS

4219. C., L. Influence de l'électricité sur la végétation. [Influence of electricity on plants.] Prog. Agric. et Vitic. 74: 376-377. 1920.—Tobacco, cabbage, leek, salsify, cardoon,

celery, potato, carrot, rape, bean, and lettuce are reported to have been improved either as to yield or quality by subjecting them to an electric discharge.—*E. L. Proebsting*.

4220. TAYLOR, C. V. Microelectrodes and micromagnets. *Proc. Soc. Exp. Biol. and Med.* 23²: 147-150. 1925.—The method of making microelectrodes and micromagnets is fully described. This apparatus affords a means for the study of the electric and magnetic properties of protoplasm in the interior of the living cell.—*M. M. Brooks*.

MISCELLANEOUS

4221. CHATTERJI, NITYA GOPAL, AND GEORGE INGLE FINCH. A circulation apparatus for gases. *Jour. Chem. Soc. (London)* 127: 2464-2466. 1 fig. 1925.

4222. DEUSS, J. J. B. Iets over na-fermentatie. [Notes on after-fermentation.] *Dept. Landb. Nijverheid. en Handel, Mededeel. Proefsta. Thee Nederland Indië* 93: 17-19. *Illus.* 1925.—Examination of gases produced by tea in different kinds of containers.—*Carl Hartley*.

4223. PEARSON, A. R., AND J. S. G. THOMAS. A simple form of gas circulating apparatus. *Jour. Chem. Soc. (London)* 127: 2450-2451. 1 fig. 1925.—This easily made apparatus acts on the principle of the hot air engine and causes a circulation of gas through a closed system. "With the dimensions shown, the apparatus drives about 2 cubic feet of gas per hour against a total back pressure of about 3 inches of water."—*F. E. Denny*.

4224. RICE, FRANK E., AND ARTHUR J. RIDER. Simplified apparatus and technique of hydrogen-ion determination in milk and other biological liquids. New York [Cornell] *Agric. Exp. Sta. Mem.* 66: 3-16. 1923.—Based on a study of certain factors that may influence the rapidity and accuracy of H-ion determinations by the electrometric method, a simplified apparatus has been described which is not only suited for student laboratories but is satisfactory for research work.—*Lewis Knudson*.

4225. STERN, H. T. The colorimetric pH test of water or unbuffered solutions. *Jour. Biol. Chem.* 65: 677-681. 1925.

TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

E. B. PAYSON, *Assistant Editor*

(See also in this issue Entries 3057, 3065, 3269, 3272, 3283, 3312, 3451, 3476, 3499, 3512, 3513, 3527, 3567, 3608, 3616, 3704, 3716, 3728, 3730, 3859, 4161)

GENERAL

4226. B[LACK], J. M. Australian botanical nomenclature. *South Australian Nat.* 6: 57-58. 1925.—A committee is listed to draw up recommendations for stabilizing the nomenclature of Australian plants to be submitted to the International Botanical Congress at Ithaca, New York, U. S. A., in August, 1926. A list of proposed nomina conservanda is given.—*Wm. Randolph Taylor*.

4227. F[ERNALD], M. L. [Rev. of: PEASE, A. S. Vascular flora of Coös County, New Hampshire. *Proc. Boston Soc. Nat. Hist.* 37²: 39-388. Pl. 5-11. 1924. (See Bot. Absts. 14, Entry 1268.)] *Rhodora* 27: 52. 1925.

4228. FRITZ, EMANUEL. A plea for common sense in changes of botanical nomenclature. *Jour. Forest.* 21: 61-64. 1923. The author asks if it is not time to stop changing the Latin names of trees. Appended is a resolution by the California Section of the Society of American Foresters condemning proposed changes in the nomenclature of the U. S. Forest Service check list and insisting that any proposed changes in botanical nomenclature be submitted to a larger committee of representative American botanists than heretofore.—*Philip C. Wakeley*.

4229. GAMBLE, J. S. *Flora of the Presidency of Madras. Part VII. P. 1161-1346.* Adlard & Son and West Newman, Ltd.: London, 1925.—The present part embraces the families Nyctaginaceae to Euphorbiaceae inclusive. The following new combinations are indi-

cated: *Allmania longepedunculata* (A. *nodiflora* R. Br. var. *longepedunculata* Trimen), *Litsea deccanensis* (L. *tomentosa* Heyne), *L. laevigata* (*Tetranthera attenuata* var. *laevigata* Nees), *L. nigrescens* (T. *Panamanja* Wt., not Buch.-Ham.), *L. floribunda* (*Cylicodaphne floribunda* Bl.), *Neolitsea scrobiculata* (*Litsea scrobiculata* Meissn.), *N. foliosa* (L. *foliosa* Nees), *Lasiosiphon eriocephalus* Dcne. var. *sisparensis* (*Gnidia sisparensis* Meissn.), *Loranthus courtalensis* (L. *bracteatus* var. *angustifolia* Hook. f.), *Reidia macrocalyx* (*Phyllanthus macrocalyx* Muell. Arg.), *R. Bailloniana* (P. *Bailloniana* Muell. Arg.), *R. longiflora* (P. *longiflorus* Heyne), *Glochidion sisparens* (G. *arborescens* Hook. f., in part, not Wt.), and *G. pauciflorum* (G. *arborescens* var. *pauciflorum* Hook. f.).—J. M. Greenman.

4230. GOETHART, J. W. C. Die Boerhaave'schen copien der Abbildungen des Botanicon Americanum von Plumier. [The Boerhaave copies of the plates of American botany by Plumier.] Mededeel. Rijks Herb. [Reprint] 5: 75. 1923.—Boerhaave in 1753 had the artist Aubriet copy 508 of Plumier's 1219 original plates. These copies were used by Linnaeus in the preparation of his "Species Plantarum," and hence are of importance for a correct understanding of many species. The published reproductions of these plates by Burmann are said to be not wholly above criticism. Reference should be made to Boerhaave's copies which are in the library of Groninger University.—M. F. L. Fitzpatrick.

4231. GUNDERSEN, ALFRED. Is an international list of genera of cultivated plants possible? Science 62: 589. 1925.—This is chiefly a group of opinions of representatives of botanic gardens throughout the world. Agreement on a list of genera and families appears imminent.—C. J. Lyon.

4232. KOORDERS, S. H. Exkursionsflora von Java umfassend die Blütenpflanzen. [Excursion-flora of Java comprising the flowering plants.] Vol. 4. Atlas. 4 Abt. 1 Hälfte. P. 337-418. Fig. 592-684. 1924; 2 Hälfte. P. 419-500. Fig. 685-780. 1924; 5 Abt. 1 Hälfte. P. 501-588. Fig. 781-870. Gustav Fischer: Jena, 1925.—These parts have been edited, as were the last 2 parts issued, by A. Koorders-Schumacher and carry the work forward from the Orchidaceae to the Balanophoraceae inclusive. Each part is provided with an alphabetical index to the species which gives reference to its illustration in the atlas and to its description published in a previous volume.—J. M. Greenman.

4233. KOPS, JAN, F. W. VAN EEDEN, EN L. VUYCK. Flora Batava. Afbeelding en Beschrijving der Nederlandsche Gewassen. [Flora of Batavia. Illustrations and descriptions of plants of Holland.] 422e-425e Aflevering. Pl. 2081-2096. Martinus Nijhoff: 's-Gravenhage, 1925.—The vascular plants described and illustrated in the present parts are: *Rubus sciaphilus* Lange × *pyramidalis* Kaltenb. f. *brevis* W. W. Schipper, *Verbena bracteosa* Michx., *Rubus sciaphilus* Lange × *pyramidalis* Kaltenb. f. *elongata* W. W. Schipper, *Geum alep-picum* Jacq., *Rubus sciaphilus* Lange, *Plantago Psyllium* L., *Verbena bonariensis* L., and *Aster Lindleyanas* T. & G. The non-vascular plants included are: *Polyporus dryadeus* Fr., *Collybia ingrata* Schum., *Trametes hispida* Bagl., *T. serpens* Fr., *Arcyria nutans* Bull., *Brefeldia maxima* (Fr.) Rost., *Pluteus patricius* Boud., *P. salicinus* P., *Lactarius aurantiacus* Fr., *Hygrophorus obrusseus* Fr., *H. ceraceus* Wulf., *Xylaria carpophila* Pers., *Sclerotinia Richteriana* P. Henn. & Staritz, and *Pholiota dura* Bolt.—J. M. Greenman.

4234. TIDESTROM, IVAR. Flora of Utah and Nevada. Contrib. U. S. Nation. Herb. 25: 1-665. Pl. 1-15, fig. 1-2, map. 1925.—The annotated list which forms the bulk of the work is preceded by 3 sections descriptive of the general aspects of the flora, and by a key to families. The 1st section describes the topography of the area and the principal belts of vegetation. The 2nd, by H. L. SHANTZ, describes in more detail the principal plant formations below the mountain areas, while the 3rd, by A. W. SAMPSON, deals with those of the foothill, montane, and alpine regions. In the annotated catalogue, containing about 3700 species, the genera and species are keyed, and the species are listed with their principal synonymy, local range (usually expressed in terms of floristic belts), and general range. The treatments of several families and genera have been contributed by Washington botanists, the principal contributors being W. R. MAXON (Pteridophyta), AGNES CHASE (Poaceae), and S. F. BLAKE (Asteraceae). The illustrations include a colored map showing plant belts and views of some of the principal plant associations, to which are added for comparison views of similar areas in Spain. The largest genera are *Astragalus* (120 species), *Erigonum* (96),

Carex (67), *Pentstemon* (65), and *Lupinus* (53). The following new names appear, Tidestrom being authority unless otherwise stated: *Hookera pauciflora* (Torr.), *Claytonia utahensis* (Rydb.), *C. rubra* (Howell), *Montia Chamissoi* (Ledeb.), *Delphinium amabile* (*D. coelestinum* Rydb., not Franch.), *Cheirinia occidentalis* (S. Wats.), *Parrya pedicellata* (A. Nels.), *Cleome serrulata angusta* (Jones), *Cleomella grandiflora* (S. Wats.) Coville, *Dipetalia linifolia* (Vahl), *Lotus nummularius* (Jones), *Psoralea Bigelovii* (Rydb.), *Astragalus heliophilus* (Rydb.), *A. arctus* (Jones), *A. simplex* (*Homalobus brachycarpus* Nutt., not *A. brachycarpus* Bieb.), *Oxytropis viscidula* (Rydb.), *Tithymalus subpubens* (Engelm.) Norton, *T. luridus* Pringlei Norton, *T. schizolobus* (Engelm.) Norton, *Chamaesyce versicolor* (Greene) Norton, *C. setiloba* (Engelm.) Norton, *Sphaeralcea Fremontii* (Torr.), *S. Rydbergii* (*S. grandiflora* Rydb., not Phil.), *Frankenia campestris* (A. Gray), *Mentzelia integra* (Jones), *M. acuminata* (Rydb.), *Aulospermum basalticum* (Jones), *A. duchesnense* (Jones), *Pseudocymopterus anisatus longilobus* (Rydb.), *Gentiana scopulorum* (Greene), *Welwitschia densifolia* (Benth.), *Gymnosteris Rydbergii* (*Gilia parvula* Rydb., not Greene), *Nyctelea pinetorum* (Jones), *Greeneocharis dichotoma* (Greene), *Salvia carnosa pilosa* (A. Gray) H. M. Hall, *Pentstemon incanus* (A. Gray), *Coleosanthus oblongifolius linifolius* (D. C. Eaton) Blake, *Chrysopsis Jonesii* Blake (*C. caespitosa* Jones, not Nutt.), *C. viscida ciliata* (A. Nels.) Blake, *Solidago petradoria* Blake (*Chrysoma pumila* Nutt., not *S. pumila* Crantz), *Aplopappus spinulosus Gooddingii* (A. Nels.) Blake, *A. Clementis* (Rydb.) Blake, *A. subviscosus* (Greene) Blake, *A. eriopodus* (Greene) Blake, *A. Nelsonii* Blake (*Stenotus latifolius* A. Nels., not *A. latifolius* Reiche), *A. falcatus* (Rydb.) Blake, *A. Rydbergii* Blake (*Macronema obovatum* Rydb., not *A. obovatus* Reiche), *A. acradenius* (Greene) Blake, *A. heterophyllus* (A. Gray) Blake, *A. scopulorum* (Jones) Blake, *Chrysothamnus speciosus frigidus* (Greene) Blake, *C. viscidiflorus stenolepis* (Rydb.) Blake, *Aster commutatus polycephalus* (Rydb.) Blake, *A. commutatus crassulus* (Rydb.) Blake, *A. wasatchensis* (Jones) Blake, *A. hirtifolius* Blake (*Diplopappus ericoides hirtellus* A. Gray, not *A. hirtellus* Lindl.), *A. leucelene* Blake (*Inula ericoides* Torr., not *A. ericoides* L.), *A. abatus* Blake (*Aplopappus tortifolius* T. & G., not *Aster tortifolius* Michx.), *A. parvulus* Blake (*Machaeranthera parviflora* A. Gray, not *A. parviflorus* Nees), *A. tagetinus* (Greene) Blake, *A. tephrodes* (A. Gray) Blake, *A. leiodes* Blake (*Machaeranthera laetevirens* Greene, not *A. laetevirens* Greene), *A. cichoriaceus* (Greene) Blake, *A. rubrotinctus* Blake (*Machaeranthera rubricaulis* Rydb., not *A. rubricaulis* Lam.), *A. brachyactis* Blake (*Aster angustus* (Lindl.) T. & G., not Nees), *Ambrosia pilosolachya californica* (Rydb.) Blake, *Actinea canescens* (D. C. Eaton) Blake, *A. Lemmoni* (Greene) Blake, *A. acaulis lanigera* (Daniels) Blake, *A. acaulis arizonica* (Greene) Blake, *Gaillardia arizonica Pringlei* (Rydb.) Blake, *Raillardella scaposa nevadensis* (Nels. & Kennedy) Blake, *Senecio Purshianus eradiatus* (D. C. Eaton) Blake, *S. cymbalarioides aphanactis* (Greenm.) Blake, *Ptiloria tenuifolia myriocada* (D. C. Eaton) Blake, *Agoseris gracilens Greenei* (A. Gray) Blake, and *A. scorzoneraefolia aspera* (Rydb.) Blake.—S. F. Blake.

4235. WALCOTT, MARY VAUX. North American wild flowers. *Folio. P. 1-77. Pl. 1-77.* Smithsonian Institution: Washington, 1925.—This work contains illustrations and descriptions of 77 species of North American plants, many of which are from the Canadian Rockies. A foreword, a list of patrons, and a table of contents precede the illustrations and text. Each species is depicted life size and in its natural colors. The text accompanying each plate gives the scientific and common name, a brief description, and a statement of the geographical range of the plant concerned.—J. M. Greenman.

PTERIDOPHYTES

4236. BOSCH, R. B. VAN DEN. Synopsis Hymenophyllacearum, etc., Teil II. [Synopsis of the Hymenophyllaceae, etc., part II.] Mededeel. Rijks Herb. 38: 1-41. 23 fig. 1919.—This is a continuation of the monographic synopsis of the Hymenophyllaceae, part I of which was published in Med. Rijks Herb. 17. Diagnoses of over 40 species with notes on half as many more of the genus *Trichomanes* (*Ptilophyllum* Bosch) are given, many of which had been previously proposed as new by the author. Annotations, notes, observations, and numerous explanatory illustrations are included.—M. F. L. Fitzpatrick.

4237. CHRISTENSEN, CARL. Plantae sinenses a H. Smith 1921-22 lectae III. Pterido-

phyta. [Plants of China collected in 1921-22 by H. Smith III. Pteridophyta.] Acta Hort. Gothoburg. 1: 41-119. Pl. 16-20. 1924.—The 1st section of this extensive report deals with the species collected in the province of Chili; the new species *Woodsia gracillima* is described. The 2nd is a complete list of all ferns and fern-allies (except *Selaginella*, left aside for further study) of the province of Szechuan, including 376 species and varieties. Christensen is the author of the following new species, varieties, and combinations: *Cystopteris sudetica* A. Br. var. *moupinensis* (C. moupinensis Franch.), *Dryopteris oneiensis* (Bak.) C. Chr. var. *flexilis* (*Aspidium flexile* Christ), *D. stegogramme* (Bl.) C. Chr. var. *cyrtomioides*, *D. filix-mas* (L.) Schott subsp. *fibrillosa* (*Nephrodium fibrillosum* Clarke, *Dryopteris fibrillosa* Hand.-Maz.) and var. *Rosthornii* (*Aspidium Rosthornii* Diels, *Dryopteris Rosthornii* C. Chr.), *D. cochlaeta* (Don) Moore var. *squamosa*, *D. heterolaena*, *D. speciosa* (*Polystichum speciosum* Don), *Polystichum deltodon* (Bak.) Diels var. *marginale* (*P. hecatopterum* Diels var. *marginale* Christ), *P. squarrosum* (Don) Fée var. *chinense* (*P. lobatum* var. *chinense* Christ), *Davallia Clarkei* Bak. var. *Faberiana*, *Athyrium unifurcatum* (*Nephrodium unifurcatum* Bak., *Dryopteris unifurcata* C. Chr.) and var. *Harryanum*, *A. sphaeropteroides* (*Polypodium sphaeropteroides* Bak., *Dryopteris sphaeropteroides* C. Chr.), *Diplazium japonicum* (Thbg.) Bedd. var. *nudisorum*, *Asplenium lushanense*, *Pellaea Smithii*, *P. connectens*, *Cheilanthes argentea* (Gmel.) Kze. var. *obscura* (*Dryopteris argentea* var. *obscura* Christ), *C. niphobola*, *C. rosulata*, *Adiantum venulosum* Don var. *Smithianum*, *A. Davidii* Franch. var. *Prattii* (A. Prattii Bak.) and var. *aristatum* (A. aristatum Christ). A considerable number of species are reduced to others, the following synonyms being created: *Dryopteris lamprocaulis* (Christ) C. Chr. = *Alsophila glabra* (Bl.) Hook.; *Woodsia Delavayi* Christ = *W. Rosthorniana* Diels; *Onoclea germanica* Willd. var. *stenophylla* Franch. = *Mateuccia intermedia* C. Chr.; *Nephrodium Clarkei* Bak. + *Aspidium xanthomelas* Christ = *D. filix mas* (L.) Schott subsp. *fibrillosa* (Clarke) C. Chr. var. *Rosthornii* (Diels) C. Chr.; *Polystichum affine* Christ = *Dryopteris speciosa* (Don) C. Chr.; *Polystichum pinfaense* Christ and *P. Dielsii* Christ = *P. deltodon* (Bak.) Diels var. *marginale* Christ; *Dryopteris gymnogrammoides* (Bak.) C. Chr. = *D. oyamensis* (Bak.) C. Chr.; *D. pseudocuspidata* Christ = *D. penangiana* (Hook.) C. Chr.; *D. marginata* Christ + *D. juxtaposita* Christ = *D. odontoloma* (Moore) C. Chr.; *D. blepharolepis* C. Chr. and *D. Schweideriana* Hand.-Maz. = *D. sublacera* Christ; *D. basisora* Christ and *D. adenorhachis* C. Chr. = *D. fructuosa* (Christ) C. Chr.; *D. Labordei* (Christ) C. Chr. = *D. erythrosora* (Eat.) OK.; *Sorolepidium glaciale* Christ = *Polystichum Duthiei* (Hope) C. Chr.; *Polystichum nanum* Christ = *P. parvulum* Christ; *P. praelongum* Christ and *P. monotis* Christ = *P. xiphophyllum* (Bak.) Diels; *Aspidium pandiforme* Christ (*Dryopteris pandiformis* C. Chr.) = *Athyrium unifurcatum* (Bak.) C. Chr.; *Athyrium Mayrei* Rosenst. = *A. Delavayi* Christ; *A. monticola* Rosenst. and *Cystopteris grandis* C. Chr. = *A. Atkinsonii* Bedd.; *Asplenium woodsiioides* Christ = *A. yunnanense* Franch.; *Dryopteris Michellii* Christ = *D. Veitchii* Christ; *Cheilanthes Mairei* Brause = *C. albofusca* Bak.; *C. Henryi* Christ + *C. Bonatiana* Brause = *C. taliensis* Christ; *Pteris nana* Christ = *P. deltodon* Bak.; *P. Henryi* Christ = *P. dactylina* Hook.; *Polypodium Bodinieri* Christ, *P. Silvestrii* Christ, and *P. longkyense* Rosenst. = *P. nipponicum* Mett.; *P. Wilsonii* Christ = *P. Dielseanum* C. Chr.; *P. soulieanum* Christ = *P. clathratum* Clarke; *P. mayoense* C. Chr. = *P. Griffithsianum* Hook.; *P. Rosthornii* Diels = *P. hemitomum* Hance; *P. albidoglaucum* Christ = *P. malacodon* Hook.; *Cyclophorus inaequalis* (Christ) C. Chr. = *C. Sheareri* (Bak.) C. Chr.; *Drynaria reducta* Christ = *D. sinica* Diels. The 3rd and final section contains a list of a small number of ferns from Yünnan.—C. Skottsberg.

4238. HIDÉN, I. *Aspidium aculeatum* (L.) Doell.* *lobatum* Swartz uututena Suomen kasvistolle. [*Aspidium aculeatum* (L.) Doell.* *lobatum* Swartz new to the flora of Finland. Meddel. Soc. Fauna et Flora Fennica 50: 27-29. 1925.—A single individual was found by O. Kyyhkynen in Pielavesi, central Finland.—K. Linkola (translated).]

SPERMATOPHYTES

4239. ANONYMOUS. Vermischte Diagnosen II. [Miscellaneous diagnoses.] Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem 9: 290-298. 1925.—The following new species are described:

Atropis Osteniana Pilger from Uruguay; *Nasturtium Backeri* O. E. Schulz from Java; *Heterostemon Vageleri* Harms from Colombia; *Argyrolobium buaricum* Harms from Kamerun; *Leptoderris Mildbraedii* Harms from Kamerun; *L. Ledermannii* Harms from Kamerun; *Erythrina polychaeta* Harms from Ecuador; *Turraea glomeruliflora* Harms from Island of Annobon.—J. P. Young.

4240. ANDRES, H. *Plantae sinenses a H. Smith 1921-22 lectae VII. Pirolaceae.* [Plants of China collected in 1921-22 by H. Smith VII. Pirolaceae.] Acta Hort. Gothoburg. 1: 169-176. 2 fig. 1924.—Described as new: *Pirola szechuanica*, *P. calliantha*, and *Chimaphila monticola*, all from northern Szechuan.—C. Skottsberg.

4241. BARTLETT, H. H. The varieties of *Coralorrhiza maculata*. *Rhodora* 27: 11-14. 1925.—The color varieties of *C. maculata* are discussed on the basis of colored drawings of 3 forms from Ontario and Quebec, and the conclusion is reached that *C. maculata* var. *fusca* Bartlett is not identical with var. *intermedia* Farwell.—S. F. Blake.

4242. BECKER, WILH. Ein neuer Veilchen-Tripelbastard. [A new triple-bastard of *Viola*.] Repert. Spéc. Nov. Regni Veg. 20: 72-73. 1924. (Repert. Eur. et Med. 1: 632-633. 1924.)—A description is given of this triple bastard, from Lugano in Switzerland: *Viola alba* × (*hirta* × *Thomasiana*) = *V. salvatoriana* Becker & Thellung.—John E. Dinsmore.

4243. BECKER, WILH. *Viola brachyphylla* sp. nov. Repert. Spec. Nov. Regni Veg. 20: 73. 1924. (Repert. Eur. et Med. 1: 633. 1924.)—A Latin description is given of this new species, sect. *Melanium* Ging., from Macedonia.—John E. Dinsmore.

4244. BECKER, W. *Viola elatior* Fries var. *barbyensis* var. nov. Repert. Spec. Nov. Regni Veg. 20: 332-333. 1924. (Repert. Eur. et Med. 1: 652-653. 1924.)—This new variety of *Viola elatior*, from Barby in Saxony, is described.—John E. Dinsmore.

4245. BECKER, W. *Viola Stojanowii* sp. nov. Repert. Spec. Nov. Regni Veg. 19: 332-333. 1924. (Repert. Eur. et Med. 1: 620-621. 1924.)—This new species, sect. *Melanium* Ging., from Macedonia, is described in Latin.—John E. Dinsmore.

4246. BECKER, WILH. Zwei neue Bastarde der *Viola uliginosa* Bess. und *Viola elatior* × *Riviana*. [Two new hybrids of *Viola uliginosa* Bess. and *V. elatior* × *Riviana*.] Repert. Spec. Nov. Regni Veg. 21: 106-109. 1925. (Repert. Eur. et Med. 1: 682-685. 1925.)—The following are described from Sweden: *Viola silvestris* × *uliginosa* = *V. Berggrenii*, *V. persicifolia* × *uliginosa* = *V. Ekstroemiana*, and *V. elatior* × *Riviana*.—John E. Dinsmore.

4247. BORNMÜLLER, J. *Bromus oostachys* Bornm. (spec. nov.) und *Alopecurus setarioides* Gren. aus Mazedonien, adventiv bei Aken a.d. Elbe (Prov. Sachsen). [Bromus oostachys Bornm. n. sp., and Alopecurus setarioides Gren. from Macedonia, both naturalized at Aken on the Elbe, Germany.] Repert. Spec. Nov. Regni Veg. 20: 69-72. 1924. (Repert. Eur. et Med. 1: 629-632. 1924.)—Description and notes of these 2 species, both originally from Macedonia, are given.—John E. Dinsmore.

4248. BORNMÜLLER, J. *Polygonatum pruinosa* Boiss. und *Carex phyllostachys* C. A. M. in Europa. *Carex rigida* Good. var. (nov.) *Macedonica* Bornm. und *Eriophorum latifolium* Hoppe var. (nov.) *alpigenum* Bornm. Repert. Spec. Nov. Regni Veg. 19: 321-326. 1924. (Repert. Eur. et Med. 1: 609-614. 1924.)—The 2 new varieties here described are both from Dolnja Mandra-Begova in Macedonia.—John E. Dinsmore.

4249. BORNMÜLLER, J. Was ist *Onobrychis megalophylla* Griseb.? [What is *Onobrychis megalophylla* Griseb.?] Oesterreich. Bot. Zeitschr. 74: 237-244. 1925.—The 1st part of this work is concerned with the systematic position of *Onobrychis megalophylla* Griseb. Boissier places the name as a synonym of *O. Tournefortii* (Willd.) Boiss. The author, on the basis of comparison of new material collected by Burgeff in 1922 in the same locality (Štip in Macedonia) as the original material of Grisebach, comes to the conclusion that the last 2 plants are conspecific, but have nothing to do with *O. Tournefortii*. *O. megalophylla* is, on the contrary, identical with the widely distributed *O. hypargyrea* Boiss. of Asia Minor.—The 2nd part of the work is concerned with the plants associated with the *Onobrychis hypargyrea* Boiss. This plant is an inhabitant of a treeless, bleak hill-country. In this plant-association the following are worthy of mention: *Anoplangium coccineum* Walp., *Alyssum Dörfleri* Deg., *A. linifolium* Stev., *Helianthemum hymettium* Boiss. & Heldr., *Salvia Jurisicii* Košan., *Astragalus odoratus* Willd., and *Colladonia anatolica* Boiss.—H. Cammerloher (translated).

4250. BORNMÜLLER, J. Zwei unbeschriebene *Onobrychis*-Arten aus der Flora Süd-Persiens und Assyriens. [Two new species of *Onobrychis* from southern Persia and Assyria.] Repert. Spec. Nov. Regni Veg. 20: 74-76. 1924. (Repert. Eur. et Med. 1: 634-636. 1924.)—Two new species of *Onobrychis*, namely, *O. Plantago*, from southeastern Persia, and *O. bicolor* from Assyria are described in Latin.—John E. Dinsmore.

4251. BURKILL, I. H. Notes on Dipterocarps. 10: On *Balanocarpus Hemsleyanus* King. Jour. Malayan Branch Roy. Asiatic Soc. 3: 4-9. Fig. 1-8. 1925.—A discussion is given of the classification of the family with particular reference to *Balanocarpus*, and a description of the seed and seedling of *B. Hemsleyanus*. A comparison is made with 5 other species of the genus.—R. E. Holttum.

4252. CHEEL, E. A new Myrtaceous plant. Jour. and Proc. Roy. Soc. Western Australia 10: 5. 1924.—*Baeckia minutifolia* n. sp., with affinities with *B. crassifolia* and *B. Maidenii*, is described.—Wm. Randolph Taylor.

4253. CHENEY, R. H. A white form of *Delphinium Ajacis*. *Rhodora* 27: 139-142. 1925.—A form of *Delphinium Ajacis* L. with pure white flowers, here named f. *alba*, was found in Massachusetts and New Hampshire in 1924. Although most European floras describe the flowers of this species as sometimes white, no European material with pure white flowers was found by the writer in several large herbaria examined.—S. F. Blake.

4254. COHEN STUART, C. P. *Camellia theifera* or *Thea sinensis*. *Thee* 5: 137-138. 1924.—The writer withdraws from his previous position and agrees that the latter name should be used.—Carl Hartley.

4255. DEWILDEMAN, É. Matériaux pour la flore forestière du Congo Belge IV-V. [Materials for a forest flora of Belgian Congo. IV-V.] Ann. Soc. Sci. Bruxelles 44: 366-374. 1925; VI-VII. *IBID.* 536-547. 1925.—The author reviews the genus *Angylocalyx* (Leguminosae), describing *A. Claessensi* n. sp. The genus *Osyris* (Santalaceae) is also reviewed, and *O. urundiensis* n. sp., from the region northeast of the Urundi, is described. In the 6th note further information is recorded on *Osyris urundiensis*; in the 7th a few remarks are made on the genus *Croton* in the Congo, and the following new species are described: *Croton Claessensi* Vermoesen, *C. Sereti* Vermoesen, and *C. Wellensi*.—Author (translated).

4256. DEWILDEMAN, É. Sur quelques Légumineuses africaines nouvelles. [Some new African Leguminosae.] Rev. Zool. Africaine [Suppl. Bot.] 13²: B1-B27. 1925.—In these fascicles the following species are described: *Aeschynomene Claessensi*, *A. mukuluensis*, *A. Mearnsi* (British East Africa); *Clitoria Mearnsi* (British East Africa); *Dalbergia grandibracteata*, *D. Mearnsi* (British East Africa), *D. rufo-tomentosa*, *D. ruwenzoriensis*; *Droogmansia Giorgii*, *D. Vanderysti* (Angola); *Lathyrus Bequaerti*, *L. tshilirungensis*; *Leptoderris Achteni*, *L. katangensis*; *Smithia Bequaerti*; *Vicia Bequaerti*, *V. Claessensi*; and *Zornia durummuensis*.—Author (translated).

4257. DIELS, L. *Plantae sinenses a H. Smith 1921-22 lectae VIII. Iridaceae*. [Plants of China collected in 1921-22 by H. Smith VIII. Iridaceae.] Acta Hort. Gothoburg. 1: 177-178. 1924.—A list of 8 species, mainly found in Szechuan. The diagnosis of the only new species, *Iris polysticta* Diels, had already been published in Svensk Botan. Tidskr. 28: 428.—C. Skottsberg.

4258. DIELS, L. *Plantae sinenses a H. Smith 1921-22 lectae IX. Ericaceae*. [Plants of China collected in 1921-22 by H. Smith IX. Ericaceae.] Acta Hort. Gothoburg. 1: 179-183. 1924.—The localities in Szechuan or North Yunnan visited by Smith were not so rich in Rhododendrons as many other parts of western China; only 17 species are listed, one, *R. daphniflorum*, being described as new. Among the other Ericaceae is 1 new variety, *Gaultheria pyrolloides* Hook. f. & Thoms. var. *reducta*.—C. Skottsberg.

4259. FASSETT, NORMAN C. *Aster puniceus* L. var. *firmus* (Nees) T. & G. f. *rufescens*, n. f. *Rhodora* 27: 187. 1925.—A new form of *Aster puniceus* from Quebec, is characterized as having leaves dark red on the upper surface.—S. F. Blake.

4260. FASSETT, NORMAN C. *Bidens Eatonii* and its varieties. *Rhodora* 27: 142-146. 1925.—*Bidens Eatonii* Fernald is divided into 7 varieties, inhabiting several estuaries on the New England coast. *B. Eatonii* Fernald var. *typica*, var. *interstes* (Fassett), var. *mutabilis*, var. *simulans*, and var. *major* are new. *Bidens multiceps*, from the estuary of the Taunton

River, Massachusetts, is described as a new hybrid between *Bidens connata* and *B. Eatoni* (?).—*S. F. Blake.*

4261. FASSETT, NORMAN C. *Bidens hyperborea* and its varieties. *Rhodora* 27: 166-171. 1925.—*Bidens hyperborea* Greene is divided into 7 varieties, occurring from James Bay to northeastern Massachusetts. New varieties are var. *typica*, var. *laurentiana*, and var. *Svensoni*. A hybrid *Bidens* from Maine is described as *B. cernua* \times *hyperborea* var. *colpophila*.—*S. F. Blake.*

4262. FASSETT, NORMAN C. Notes on *Distichlis*. *Rhodora* 27: 67-72. 1925.—*Distichlis spicata*, as treated by most American authors, is a complex of 2 distinct species, *D. spicata* (L.) Greene and *D. stricta* (Torr.) Rydb. The former occurs on the east coast, Vancouver Island, tropical America, and doubtfully in western Texas; the latter, which includes *D. dentata* Rydb., is a species of western North America. *Distichlis Palmeri* (Vasey) Fassett is described and discussed. *Uniola distichophylla* Labill., of Australia, is transferred to *Distichlis* as *D. distichophylla* (Labill.) Fassett, its synonymy given, and its distinctive characters noted.—*S. F. Blake.*

4263. FASSETT, NORMAN C. Notes on the flora of Boothbay, Maine. *Rhodora* 27: 53-56. 1925.—Various range extensions for Maine plants are given. *Eupatorium perfoliatum* L. f. *truncatum* (Muhl.) and f. *trifolium* are new names.—*S. F. Blake.*

4264. FERNALD, M. L. Another *Arnica* from Newfoundland. *Rhodora* 27: 90-92. 1925.—*Arnica terrae-novae* is described and compared with related species.—*S. F. Blake.*

4265. FERNALD, M. L. *Erysimum Pallasii* (Pursh) n. comb. *Rhodora* 27: 171. 1925.—The new combination, *Erysimum Pallasii* (Pursh) Fernald, is proposed for the arctic mustard usually known as *E. pygmaeum* or *Hesperis Pallasii*.—*S. F. Blake.*

4266. FERNALD, M. L. Notes on *Sagina*. *Rhodora* 27: 130-131. 1925.—The Asiatic *Sagina micrantha* (Bunge) n. comb. is recorded from islands off Alaska. *Sagina saginoides* (L.) Dalla Torre is represented in America by 2 forms, one of which, from western North America, is described as var. *hesperia*.—*S. F. Blake.*

4267. FERNALD, M. L. *Pontederia* versus *Unisema*. *Rhodora* 27: 76-81. 1925.—The history of the name *Pontederia* is discussed, and it is shown that it should continue to be used for *Pontederia cordata* and its allies. *Pontederia cordata* of eastern North America, as generally understood, proves to be divisible into 2 species, *P. cordata* L. and *P. lanceolata* Nutt., the latter occurring from South Carolina to Paraguay. Each is divisible on foliage characters into 3 forms. *P. lanceolata* f. *trullifolia* and f. *brasiliensis* (Solms) are new names.—*S. F. Blake.*

4268. FERNALD, M. L. The American representatives of *Lonicera caerulea*. *Rhodora* 27: 1-11. 1925.—*Lonicera caerulea* L. is Eurasian, and does not occur in America. The American plants which have been referred to it belong to 2 species—a red-berried western species, ranging from Washington to Wyoming and California, here described as *L. cauriana* Fernald, and a blue-berried eastern species, *Lonicera villosa* (Michx.) R. & S., ranging west to Minnesota and Manitoba. *Lonicera villosa* is divisible into 5 varieties—var. *typica* Fernald, var. *Solonis* (Eaton) Fernald, var. *calvescens* (Fernald & Wiegand) Fernald, var. *tonsa* Fernald, and var. *Fulleri* Fernald.—*S. F. Blake.*

4269. FERNALD, M. L. The maritime plantains of North America. *Rhodora* 27: 93-104. *Pl.* 150. 1925.—The names *Plantago maritima* and *P. decipiens*, as used by American writers, cover 3 species, here keyed, discussed, and illustrated. The true *P. maritima* L. is known in North America only by a specimen doubtfully collected in Alaska. *Plantago juncoides*, in various forms, occurs on both North American coasts, in arctic Europe, and in Patagonia. Five varieties are recognized: var. *typica* Fernald, var. *californica* Fernald, var. *decipiens* (Barnéoud) Fernald, var. *glauca* (Hornem.) Fernald, var. *laurentiana* Fernald. *Plantago oliganthos* R. & S. is a species of eastern North America, and is found also about salt springs in Manitoba. It occurs in 2 varieties, var. *typica* Fernald and var. *fallax* Fernald.—*S. F. Blake.*

4270. FERNALD, M. L. The validity of *Eleocharis quadrangulata*. *Rhodora* 27: 37-40. *Pl.* 149. 1925.—The distinctive characters of *Eleocharis quadrangulata* (Michx.) R. & S. and of 2 species which have been confused with it, *E. mutata* (L.) R. & S. and *E. fistulosa*

(Poir.) Schult., are described and illustrated, and the range of these species defined.—S. F. Blake.

4271. FERNALD, M. L. Two new *Epilobiums* of eastern America. *Rhodora* 27: 32-34. 1925.—*Epilobium densum* var. *nesophilum* Fernald, from Newfoundland and the Magdalen Islands, is raised to specific rank as *E. nesophilum*, and the new species *E. Pylaeanum*, from Newfoundland, is described.—S. F. Blake.

4272. [FLAKSBERGER, K.] Фляксбергер, К. Пшеницы Однозернянки. [One-grained wheat.] (English summary.) Труды по прикл. Бот. и селекции [Bull. Appl. Bot. & Plant-breed.] 15: 207-227. 8 fig., 1 map. 1925.—The author describes 4 new varieties of *Triticum monococcum aegilopoides* Asch. & Gr.—var. *pseudo-Baeoticum*, var. *symbolonense*, var. *Baidaricum* and var. *Hellenae*, and 1 new variety of *T. monococcum cereale* Asch. & Gr.—var. *artiaristatum*. Keys to the varieties of *T. monococcum aegilopoides* and *T. monococcum cereale* are given.—M. Demerec.

4273. FRIES, THORE C. E. En ny *Plectranthus*. [A new *Plectranthus*.] *Acta Hort. Gothoburg.* 1: 253-255. 1 fig. 1924.—Under the name of *P. saccatus* Benth. a species of *Plectranthus* has been grown in various European gardens for more than 20 years. The author shows that it cannot be this species and describes it as *P. Örtendahlia* Th. Fr. Jr. It is closely related to *P. ciliatus* E. Mey. from Natal, which region may be the home of the new species as well. The Director of the Göteborg Garden, C. SKOTTSBERG, has added a few remarks on its cultivation.—C. Skottsberg.

4274. FRÖDERSTRÖM, H. *Plantae sinenses* a H. Smith 1921-22 lectae II. *Crassulaceae*. [Plants of China collected in 1921-22 by H. Smith II. *Crassulaceae*.] *Acta Hort. Gothoburg.* 1: 23-40. Pl. 11-15, 3 fig. 1924.—The genus *Sedum* (*Rhodiola* included) is alone represented. New forms or combinations are: *S. Kirilowii* Reg. var. *altum*, *S. eurycarpum*, *S. Telephium* L. f. *verticillata* (*S. verticillatum* L.), *S. fimbriatum* Franch. var. α *genuinum* (*Umbilicus thyrsoflorus* DC.) and var. β *ramosissimum* (*Umbilicus ramosissimus* Max.), *S. japonicum* Sieb. f. *rugosum*, *S. anthoxanthum*. The 2 new species come from northern Szechuan. *S. Chanetii* Lévl., *S. pyramidale* Praeger, and *S. limuloides* Praeger are all reduced to *S. fimbriatum* β *ramosissimum*.—C. Skottsberg.

4275. GLEASON, H. A. Five new species of *Lobeliaceae*. *Torreya* 25: 92-95. 1925.—The following new species are described: *Centropogon poasensis* from Costa Rica, *C. rubrovenosus*, *Siphocampylus corynellus* and *S. fissus* from Peru, and *S. flavoruber* from Bolivia.—Wm. G. McGinnies.

4276. [GRAVIROVSKOI, E.] Гравировской, Е. Очерк карпологической системы *Compositae*. [Outline of the carpological system of the *Compositae*.] *Acta Univers. Wro-nesensis* 1923-1925: 1-11. Fig. 1-12. 1925.—The writer distinguishes several groups of *Compositae* by differences in structure of the receptacle. *Achillea*, *Calendula*, *Bidens*, *Cichorium*, *Helianthus* and *Senecio* are the types described as representatives of the diverse groups.—L. J. Pessin.

4277. HALLIER, HANS. Beiträge zur Kenntnis der *Thymelaeaceen* und ihrer natürlichen Umgrenzung. [Contributions to the knowledge of the *Thymelaeaceae* and its natural limits.] *Mededeel. Rijks Herb.* 44: 1-31. 1922.—A careful study and discussion are presented of the genera *Aquilaria*, *Gyrinopsis*, *Brachythalamus*, *Gyrinops*, and *Lachnolepis*, with a view to a more perfect classification. The author places the genus *Gonystylus* in the *Thymelaeaceae* instead of in the *Columniferae*. The following species are delimited and proposed as new: *Aquilaria decemcostata*, near the Dahican river, Leguna province, Luzon; *A. khasiana*, tropical region of Khasia; *Enkleia riouwensis*, Riouw islands, Tandjung (Point of land); *E. coriacea*, West Borneo; *E. Zippeliana*, West New Guinea; *Linostoma leucodipterum*, West Borneo; and *L. longiflorum*, Sarawak, near Kutjing. The following new combinations are included: *Aquilaria brachyantha* (*Gyrinopsis brachyantha* Merr.), *A. urdanetensis* (*G. urdanetense* Elmer), *A. Cumingiana* (*G. Cumingiana* Dene.), *A. citrinicarpa* (*G. citrinaecarpa* Elmer), *A. pubescens* (*G. Cumingiana* var. *pubescens* Elmer), *A. podocarpa* (*Brachythalamus podocarpus* Gilg), *A. caudata* (*B. caudatus* Gilg), *A. Versteegii* (*B. Versteegii* Gilg), *A. Walla* (*Gyrinops Walla* Gaertn.), *A. moluccana* (*Lachnolepis moluccana* Miq.), and *Enkleia paniculata* (*Macgregoriaanthus paniculatus* Merr.).—M. F. L. Fitzpatrick.

4278. HALLIER, HANS. *Indonesische Leidensblumen*. [Leyden flowers from India.] Mededeel. Rijks Herb. 42: 1-17. 1922.—This paper concerns a study of the Passifloraceae of Borneo, including the collections made on the Sunda islands by J. Elbert. The following species and varieties are delimited and proposed as new: *Passiflora perakensis*, Perak; *P. Horsfieldii* Bl. var. *Elbertiana*, southeast Celebes; *Adenia vespertilio*, Sumatra, Borneo; *A. sumbawana*, Sumbawa; *A. diversifolia*, in cornfields near Gorontalo, Celebes; *A. pandurata*, in sago fields near the village Gelieb, southwest New Guinea; *A. borneensis* and var. *microcarpa*, East and West Borneo; and *A. smilacina*, East Borneo. *A. quintuplinervia* (*Modecca quintuplinervia* Miq.) is a new combination. The author states that he has made a thorough revision of the genus *Adenia* of the Passifloraceae and that he will publish a treatise on the Lennoaceae as a relative of the Borraginaceae. His conclusion is that the Passifloraceae (with the Euparopsiaceae) are the ancestors of the Caricaceae, Achariaceae, Begoniaceae, and Cucurbitaceae, not by way of the Flacourtiaceae, but can be traced by the inflorescence directly from the extinct Linaceae.—*M. F. L. Fitzpatrick*.

4279. HALLIER, HANS. Ueber Phanerogamen von unsicherer oder unrichtiger Stellung. [Phanerogams of uncertain or erroneous classification.] Mededeel. Rijks Herb. [Reprint] 1: 1-40. 1923.—This article gives the results of an exhaustive analysis of plants belonging to 25 different families, in order to secure a more perfect classification of some of the genera and species. In the Oxalidaceae he places the genus *Sarcotheca* (previously classified in the Linaceae) and combines with it the genus *Connaropsis*. This is followed by 7 species. He regards the genus *Dapania* distinct from the genus *Sarcotheca*. In a similar manner he reviews many genera and species of the Terebinthaceae, Flacourtiaceae, Euphorbiaceae, Elaeagnaceae, Olacaceae, Pittosporaceae, Cornaceae, Convolvulaceae, Lythraceae, Myrtaceae, Celastraceae, Apocynaceae, Rubiaceae, Saxifragaceae, Ternstroemiaceae, Myrcinaceae, Clethraceae, Ericaceae, Boraginaceae, Scrophulariaceae, Dioscoreaceae, Araceae, and Zingiberaceae.—*M. F. L. Fitzpatrick*.

4280. HANDEL-MAZETTI, H. *Plantae sinenses a H. Smith 1921-22 lectae* IV. *Leontopodium*. [Plants of China collected in 1921-22 by H. Smith IV. *Leontopodium*. Acta Hort. Gothoburg. 1: 111-123. 1924.—The author rejects the sections of Beauverd, which were based on the distribution of sexes, and groups the Chinese species of subg. *Euleontopodium* Beauv. (comprising also *Pseudantennaria* Beauv.) in sect. *Alpina* Hand.-Maz. and sect. *Nobilis* (Beauv) Hand.-Maz. New *Alpina* are *Leontopodium roseum*, and *L. linearifolium*; new *Nobilis* are *L. Stoechas*, and *L. haplophyllodes*. Two new natural hybrids are described: *L. conglobatum* × *leontopodioides* (*L. Smithianum* Hand.-Maz.) and *L. haplophyllodes* × *linearifolium* (*L. gracile* Hand.-Maz.). *L. Futtereri* Diels, *L. foliosum* Beauv. and *L. hastatum* Beauv. are all reduced to *L. Dedekensii* (Bur. & Franch.) Beauv.—*C. Skottsberg*.

4281. HART, T. S. The Victorian species of *Cassytha*. *Victoria Nat.* 42: 79-83. 1925.—General systematic notes and a key are given to *Cassytha gabella*, *C. melantha*, *C. pubescens*, *C. phaeolasia* and *C. paniculata*.—*Wm. Randolph Taylor*.

4282. HAYEK, A. *Plantae novae orientales*. [New oriental plants.] *Repert. Spec. Nov. Regni Veg.* 19: 333-335. 1924. (*Repert. Eur. et Med.* 1: 621-623. 1924.).—The following are described: *Polygonum idaeum* (*P. aviculare* γ *alpinum* Boiss.); *Euphorbia imperfoliata* Vis. f. *diversibractea*, from Mt. Mossor in Dalmatia; *Silene perinica* (Section *Cinnosilene*), from Macedonia; and *Hypericum perfoliatum* L. var. *Richterianum*, from Dalmatia.—*John E. Dinsmore*.

4283. HENRARD, J. TH. On a new Indian *Urochloa*. Mededeel. Rijks Herb. 43: 1-3. 1 pl. 1922.—The author delimits and proposes as new, *Urochloa marathensis* and its variety *velutina* from East India, southern Maratha country and North Canara, Bombay Presidency.—*T. J. Fitzpatrick*.

4284. HENRARD, J. TH. *Paspalum hydrophilum* spec. nov., aus Paraguay. Mededeel. Rijks Herb. 45: 1-2. 1 pl. 1922.—The author delimits and annotates the proposed new species from Paraguay growing along the Rio Paraguay. The specific name, *hydrophilum*, is given as *hydrophyllum* in the title and body of the article but correction is entered on 3rd page of cover.—*T. J. Fitzpatrick*.

4285. HENRARD, J. TH. Two new grasses from Paraguay. Mededeel. Rijks Herb. 47:

1-4. 1 pl. 1922.—The author describes as new, *Paspalum plumosum* from Pastoreo-mi, Paraguay, and *Panicum caaguazuense* (illus.) from Caaguazu, Paraguay.—T. J. Fitzpatrick.

4286. HERZOG, TH. Die von Dr. Th. Herzog auf seiner zweiten Reise durch Bolivien in den Jahren 1910 und 1911 gesammelten Pflanzen. [The plants collected by Dr. Th. Herzog on his second journey through Bolivia in 1910 and 1911.] Mededeel. Rijks Herb. 46: 1-31. 1922.—The following species are delimited and proposed as new: *Enneatypus* n. gen. of the Polygonaceae, *E. Nordenskjöldii*, an abundantly blooming small tree, in the dry forest between Embarcacion and Miraflores (Rio Bermejo); *Ruprechtia boliviensis*, shrub or tree-like shrub, at the descent of the Samaipata in the Mairana valley; *Alternanthera coriacea*, on rocky, sunny declivities above the La Paz and Araca valleys; *A. scandens*, climbing or under-shrub, in the forest near Yacuiba; *Gomphrena subalpina*, in mountain meadows on the Cuesta de los Monos; *G. hygrophila* var. *subcristata*, in damp places of the Pampa von Santa Cruz de la Sierra; *Tournefortia Herzogii* Vaupel, a shrub in the forest thicket near Villa Montes (Rio Pilcomayo); *Wernhamia* n. gen. of the Rubiaceae, *W. boliviensis* S. Moore, near Santa Cruz; *Psychotria* (§ *Euppsychotria*) *Herzogii* S. Moore, in mountain forests near Cuñurú; *Borreria Herzogii* S. Moore, in dense woods near Tres Cruces; *B. finitima* S. Moore, in Republic of Argentina between Embarcacion and Miraflores, and *B. exigua* S. Moore, on grassy slopes, in Cuesta de los Monos.—M. F. L. Fitzpatrick.

4287. HERZOG, TH., J. TH. HENRARD, L. RADLKOFER, W. SANDT, F. PAX, AND H. HALLIER. Die von Dr. Th. Herzog auf seiner zweiten Reise durch Bolivien in den Jahren 1910 und 1911 gesammelten Pflanzen, Teil V. [The plants collected by Dr. Th. Herzog during his second journey through Bolivia in the years 1910 and 1911, part 5.] Mededeel. Rijks Herb. 40: 1-77. 1 fig. 1921.—Previous installments were issued in Med. Rijks Herb. 19, 27, 29, and 33. The following new species are delimited, with descriptive and ecological notes: *Aristolochia Burelae* Herzog, around Santa Cruz de la Sierra; *Siparuna boliviensis* Herzog, shores of the Rio Paracti; *S. muricato-alata* Herzog, forest of the Rio Tocarani, about 2400 m.; *Diplokeleba Herzogi* Radlk., near Cabeza, altitude 550-700 m.; *Ionidium subglaucum* Herzog, near Camatindi (foothills of the east Cordilleres, Province Chuquisaca) about 700 m.; *Phyllanthus bolivianus* Pax & K. Hoffm., mountain ridge of the Laguna verde near Comarapa; *Croton densiflorus* Pax & K. Hoffm., in a Quebrada on the mountain side near Yacuiba; *C. pseudogracilipes* Pax & K. Hoffm., between Saipurú and Guaridi; *C. tartonrairoides* Pax & Hoffm., rocky slopes above Vallegrande; *Julocroton Herzogianus* Pax & K. Hoffm., hill camp of Florida near Palissa; *J. paniculatus* Pax & K. Hoffm., forests of the Rio Pirai shores near Santa Cruz; *Acalypha ovata* Pax & K. Hoffm., valley ravine of Locotal; *A. lycioides* Pax & K. Hoffm., near Charagua; *A. paupercula* Pax & K. Hoffm., near Camatindi; *A. Herzogiana* Pax & K. Hoffm., between Rio Pirai and Rio Cuchi; *Cissus pruinosa* Herzog, "Monte" near Cumbarute; *Styrax subheterotrichus* Herzog, undergrowth of the Yungas of San Mateo; *Paspalum Ekmanianum* Henrard, "Lomas" west of the Rio Pirai; *Aristida Mandoniana* Henrard, Bolivia, province of Larecaja, in the vicinity of Sorata in meadows, on mountain meadows near Samaipata; *Nasella trachyphylla* Henrard, near Samaipata; *Muehlenbergia Herzogiana* Henrard, edge of a glacier dump, Cordilleres Santa Benito; *M. Lehmannana* Henrard, Colombia, near Popayan; and *Arundinaria Herzogiana* Henrard, mountain forest of the Rio Saujana, 3200 m. The following new varieties are described: *Aristolochia lingulata* Ule var. *parviflora* Herzog, Santa Cruz de la Sierra; *Symplocos parvifolia* Benth. var. *subcuneata*, ridge above Comarapa, about 2600 m.; *Phyllanthus graveolens* HBK. var. *glaber* Pax & K. Hoffm., between Santa Cruz and Rio Pirai; *Croton sarcopetalus* Muell. Arg. var. *longipetiolatus* Pax & K. Hoffm., forest near Villa Montes; *C. rhamnifolius* HBK. var. *boliviensis* Pax & K. Hoffm., "Monte" near Woyuybe; *Panicum echinulatum* Mez var. *boliviense* Henrard, in a Potrero near Santa-Cruz, Paraguay; *P. olyroides* HBK. var. *hirsutum* Henrard, Paraguay, field near northeast Caaguazu, Balansa; *Aristida longiramea* Presl var. *boliviana* Henrard, between Rio Pirai and Rio Cuchi; *Bouteloua simplex* Lag. var. *actinochloides* Henrard, Bolivia, marshy prairie near Cochypata; *Eragrostis bahiensis* Schrad. var. *boliviensis* Henrard, Bolivia, Province Larecaja, in the vicinity of Sorata, 2900 m.; *E. articulata* (Schränk) Nees var. *glabrescens* Henrard; *Briza Mandoniana* var. *tuberculata* Henrard, Mandon; *B. Mandoniana* var. *Herzogiana* Henrard, near Choquetanga grande, 3600 m.; *B. Mandoniana* var. *Valle-*

grandensis Henrard, mountain beyond Vellegrande, 2300 m. The following new combinations are given; *Briza Mandoniana* (Griseb.) Henrard, equals *Calotheca stricta* Hooker var. *Mandoniana* Griseb.; *Muehlenbergia fastigiata* (Presl) Henr. equals *Sporobolus fastigiatus* Presl; and *Hordeum nodosum* L. var. *parviflorum* (Hack.) Henr. & Thell. equals *Hordeum secalinum* Schreb. var. *parviflorum* Hack., etc.—*M. F. L. Fitzpatrick.*

4288. HIDÉN, I. Die in der Blumenfarbe abweichenden Formen von *Epilobium angustifolium* L. [Different color-forms of *Epilobium angustifolium* L.] Meddel. Soc. Fauna et Flora Fennica 49: 213-215. 1925.—The known pale-flowered willow-herbs of Finland are grouped into the following 5 forms: *Epilobium angustifolium* L. f. *albiflora* Hausskn., f. *rubescens*, f. *rosea* Lindb. fil., f. *pulcherrima*, and f. *lilacina*. All were observed by the author in extensive willow-herb colonies on closely burned heaths.—*K. Linkola (translated).*

4289. HIDÉN, I. Muutamia pastori O. Kyhkynen löytämiä *Carex*-harvinaisuuksia. [Some rare forms of *Carex* found by O. Kyhkynen.] Meddel. Soc. Fauna et Flora Fennica 50: 35-37. 1925.—Rare forms of *Carex* from central and northern Finland include *Carex canescens* × *tenuiflora* (*C. Kyhkyneni* Hidén), a hybrid new to science.—*K. Linkola (translated).*

4290. HIDÉN, I. Muutamia Suomen kasvistolle uusia muotoja. [Some new forms for the flora of Finland.] Meddel. Soc. Fauna et Flora Fennica 50: 44-46. 1925.—The following forms are designated as new: *Hieracium umbellatum* L. f. *pallidiflora*, *Sonchus arvensis* L. var. *laevipes* f. *viridis*, and *Actostaphylos Uva-ursi* (L.) Spreng. f. *angustifolia*.—*K. Linkola (translated).*

4291. HU, H. H. Nomenclatorial changes for some Chinese orchids. *Rhodora* 27: 105-107. 1925.—The following new names are made: *Cordula Esquirolei* (Schltr.), *Amesia discolor* (Kränzl.), *A. Mairei* (Schltr.), *A. monticola* (Schltr.), *A. Royleana* (Lindl.), *A. Schensiana* (Schltr.), *A. setchuana* (Ames & Schltr.), *A. squamellosa* (Schltr.), *A. tangutica* (Schltr.), *A. Tenii* (Schltr.), *A. Wilsoni* (Schltr.), *A. xanthophaea* (Schltr.), *A. yunnanensis* (Schltr.), *Epipactis chinensis* (Schltr.), *E. labiata* (Pampan.), *E. Mairei* (Schltr.), *E. melinosteale* (Schltr.), *E. pauciflora* (Schltr.), *secundiflora* (Lindl.), *E. yunnanensis* (Schltr.), *Pholidota yunpeensis* (*P. yunnanensis* Schltr., not Rolfe), *Neofinetia* (*Finetia* Schltr., not Gagnep.), and *N. falcata* (Thunb.).—*S. F. Blake.*

4292. JOHNSTON, IVAN M. Further new plants collected by Mrs. Richard C. Curtis in tropical Africa. *Contrib. Gray Herb.* 75: 23-26. 1925.—The following new species from Angola and Kenya are described: *Rhynchotropis Curtisiae*, *Ekebergia pumila*, *Lactuca tincociliata*, and *L. Varianii*.—*E. B. Payson.*

4293. JOHNSTON, IVAN M. Some undescribed American spermatophytes. *Contrib. Gray Herb.* 75: 27-40. 1925.—The following new species, varieties, combinations and names occur: *Acacia Brandegeana* (Lower California), *Mabea Macbridei* (Peru), *Acalypha Macbridei* (Peru), *A. fulva* (Peru), *Sloanea amplifrons* (Guiana and Venezuela), *Fouquieria Diguetti* (*Bronnia Diguetti* Van Tieghem), *Fuchsia perbrevis* (Colombia), *F. Andrei* (Colombia), *F. atrorubra* (Colombia), *F. glaberrima* (Ecuador), *F. Hitchcockii* (Ecuador), *F. Townsendii* (Ecuador), *F. apiculata* (Ecuador), *F. spectabilis* Hook. var. *pubens* (Ecuador), *F. hypoleuca* (Ecuador), *F. macrophylla* (Peru), *F. velutina* (Peru), *F. polyanthella* (Peru), *F. abrupta* (Peru), *F. boliviana* Carr. var. *luxurians* (Colombia), *F. Steinhachii* (Bolivia), *F. furfuracea* (Bolivia), *F. Brittonii* (*F. boliviana* Britt. not Carr.), and *Gilia inyoensis* (California).—*E. B. Payson.*

4294. KILLIP, ELLSWORTH P. New tropical American species of Urticaceae. *Jour. Washington [D. C.] Acad. Sci.* 15: 289-299. 1925.—The following new species and new combinations are described: *Pilea tridentata*, *P. argentea*, *P. chiriquina*, *P. caudata*, *P. Donnell-Smithiana*, *P. Cornmanae*, *P. Rusbyi* (Britton) Killip, *P. pauciserrata*, *P. gracilipes*, *P. angustifolia*, *P. chiapensis*, *P. pallida*, *P. lippioides*, *P. Buchtienii*, *P. Hitchcockii*, *P. Pittieri*, *P. Standleyi*, and *Pouzolzia phenacoides*.—*Helen M. Gilkey.*

4295. KOIDZUMI, GEN'ITI. Contributiones ad Cognitionem Florae Asiae Orientalis. [Contributions to the knowledge of the flora of eastern Asia.] (Continued.) *Bot. Mag. Tokio* 37: 37-59. 1923.—The writer describes the following new species and varieties: *Rhododendron tectum*, *Coptis quinquefolia* Miq. var. *pedatoquinquefolia*, *Anamtia* n. gen. of Myrsinaceae, *A. stolonifera*, *Salvia japonica* Thunb. var. *lutescens*, *S. Fushimiana*, *S. nipponica* Miq. f. *tripartita*, *S. nipponica* subsp. *robusta*, *Prunus kinkiensis*, *Ilex stenophylla*, *Spiraea*

ribisoidia, *S. Kinashii*, *Lactaria Nakaiana*, *L. Iwasakiana*, *Poa ibukiana*, *Primula Okamotoi*, *P. senanensis*, *Fraxinus verecunda*, *Aster sohayakiensis*, *Ligularia telphusaeformis*, *Euphrasia pubigera*, and *Kalopanax autumnalis*. The following changes of scientific names are proposed: *Menziesia tubiflora* (*M. ciliicalyx* var. *tubiflora* Koidz.), *Salvia nipponica* Miq. f. *trisecta* (*S. trisecta* Matsum.), *Prunus pudibunda* Koidz. f. *antiqua* (*P. antiqua* Miyoshi), *Gentiana axillariflora* Lévl. & Vent. var. *Naitoana* (*G. Naitoana* Lévl. & Vent.) and var. *coreana* (*G. jesoana* var. *coreana* Nakai), *Rosa hakonensis* (Franch. & Sav.), *Lactaria acuminata* (Trimen), *L. glomerata* (Val.), *L. borbonica* (Gmel.), *Bleekeria hexandra* (Koidz.), *B. Ackeringiae* (Miq.), *B. coccinea* (Miq.), *B. elliptica* (Labill.), *B. Moorei* (Muell.), *B. sandwicensis* (Gray), *B. marianensis* (DC.), *B. littoralis* (Merr.), *Fraxinus commemoralis* (*F. Sieboldiana* Dippel, not Blume, *Cacalia tebakaensis* (Makino), *Asteromoea pinnatifida* (Maxim.), and *A. incisa* (Fischer).—*T. Fukushi*.

4296. KOIDZUMI, GEN'ITI. Contributiones ad Cognitionem Florae Asiae Orientalis XII. [Contributions to the knowledge of the flora of eastern Asia XII.] Bot. Mag. Tôkyô 38: 87-113. 1924.—The author in continuation of his studies of the eastern Asiatic flora, has described the following 26 new species and a new genus: *Brachycyrtis*, n. gen. of Liliaceae, *B. macrantha* (*Tricyrtis macrantha* Maxim.), *Pyrus sohayakiensis*, *P. Zensukeana*, *P. kiusiana*, *P. squarrosa*, *P. mikado*, *P. tambana*, *P. yamatensis*, *Fraxinus satsumana*, *Cirsium Babanum*, *Taraxacum japonicum*, *Myriactis japonensis*, *Lycoris albiflora*, *Prunus alpina*, *Tricyrtis Bakerii*, *Lycium griseolum*, *Diplazium boninense*, *Dryopteris jessoensis*, *Trichomanes bobinense*, *Diplazium Christensenianum*, *D. lutchuense*, *Dryopteris taitunesis*, *D. sacrosancta*, *D. elegans*, *D. boninensis* Kodama, *Athyrium regulare*, and *Pinus amamiana*. The following new names, varieties, and subvarieties are also included: *Pyrus rufo-ferruginea* Koidz. var. *aromatica* (Nakai & Kikuchi), subvars. *tremulans* (*P. tremulans* Koidz.), *insula* (*P. insula* Koidz.), and *amoena* (*P. amoena* Koidz.), *Scutellaria parvifolia* (Makino), *S. ussuriensis* (Regel) Kudo var. *tomentosa*, *Cirsium nipponense* (Nakai), *Taraxacum albiflorum* (Makino), *T. platycarpum* Dahlst. var. *rubicunda*, *Tricyrtis macropoda* Miq. vars. *hirsuta* and *glabrescens*, *Maackia floribunda* (Miq.) Takeda var. *pubescens*, *Fraxinus Sieboldiana* Blume var. *pubescens*, *Prunus itosakura* Sieb. var. *subsessilis* (Miyoshi), *P. pudibunda* Koidz. var. *moriokapendula* (Miyoshi) and f. *Sachra* (Miyoshi), *P. serrulata* Lindl. f. *heteroflora* (Miyoshi), *Diplazium Hookerianum*, *Polystichum Thunbergii*, *Dryopteris Christiana* Kodama, *Athyrium deltoideifrons* Mak. vars. *multifidum* (Rosenstk.) and *latisecta* (Rosenstk.), *Dryopteris Okuboana* (Makino), and *Diplazium mesosorum* (Makino).—(Courtsey Japanese Jour. Bot.)

4297. KOZO-POLJANSKI, B. Ueber die anwendung der anthanatomischen Methode in der Systematik der Angiospermen. [The anatomy of the flower as a basis for the classification of the angiosperms.] Bull. Soc. Nat. Moscow 1925: 284-310. 1 pl. 1925.—A discussion of the systematic relations of the Araliaceae, Cornaceae, Rhamnaceae, Caprifoliaceae and the Umbelliferae as determined by an anatomical study of the flowers. Strong emphasis is placed upon the value of such studies as a means of arriving at a more accurate understanding of phylogenetic relationships.—*P. D. Strausbaugh*.

4298. [KOZO-POLJANSKI, B. M.] Козо-Полянский, Б. М. Цветок Umbelliferae и третий способ происхождения эпигинии. [The flower of Umbelliferae and the third means of the origin of epigyny.] Acta Univ. Woronesensis 1923-1925: (1-48). 1925.—The writer discusses the literature on the morphology, anatomy, organography and morphogenesis of the flower of the Umbelliferae, and suggests new problems that are awaiting solution.—*L. J. Pessin*.

4299. KRAUSE, K. Araceae novae austro-americanae. [New South American Araceae.] Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem. 9: 269-274. 1925.—The following new species are described: *Heteropsis Rimbachii*, *H. peruviana*; *Anthurium barbanum*, *A. mareense*, *A. Hoehnei*, *A. Holmgrenii*; *Monstera Snethlagei*; *Philodendron discolor* and *P. cyclophyllum*.—*J. P. Young*.

4300. KRAUSE, K. Plantae sinenses a H. Smith 1921-22 lectae X. Araceae. [Plants of China collected in 1921-22 by H. Smith X. Araceae.] Acta Hort. Gothoburg. 1: 185-187. 1924.—Araceae are not plentiful in western China. The small collection contained 1 new species, *Arisaema Smithii*, from south Szechuan.—*C. Skottsberg*.

4301. KRÜSCHE, E. Neue Arten und Formen aus Nordwest-Deutschland. [New species and forms from northwestern Germany.] Repert. Spec. Nov. Regni Veg. 19: 329-332. 1924. (Repert. Eur. et Med. 1: 617-620. 1924.)—The following are described: *Bromus gracilis*, and var. *micromollis*; *Trifolium repens* L. subsp. *angustiflorum*; *Artemisia vulgaris* L. var. *incana*; *Hieracium praealtum* Vill. subsp. *sollingense*, and f. *serotinum*.—John E. Dinsmore.

4302. LEWTON, FREDERICK L. Notes on the taxonomy of American and Mexican Upland cottons. Jour. Washington (D. C.) Acad. Sci. 15: 65-71. 1925.—The author quotes many authorities to show that neither *Gossypium mexicanum* Todaro nor *G. siamense* Tenore is the correct name for American Upland cotton, and that there is no valid evidence of an Asiatic origin for it.—Helen M. Gilkey.

4303. LEWTON, FREDERICK L. The value of certain anatomical characters in classifying the Hibisceae. Jour. Washington (D. C.) Acad. Sci. 15: 165-172. 1925.—The anatomical characters generally used in the determination of plants in this tribe, such as numerical divisions of the style and ovary, length of style-branches, shape and size of involucre bracts, number of leaf nectaries, petal spots, and covering of the seed, have proved unsatisfactory in general, and the author suggests the substitution of the following characters: (1) Extrafloral nectaries—position, number, shape, and size; (2) black oil glands—presence or entire absence, distribution; (3) fringe of hairs on valves of carpels; (4) persistence of involucre bracts; (5) adnation of bracts to each other; and (6) number of chromosomes.—Helen M. Gilkey.

4304. LIRO, J. I. Ueber die brandige aptera-Form von *Polygonum dumetorum* L. [The blighted wingless form of *Polygonum dumetorum* L.] Ann. Soc. Zool.-Bot. Fennicae Vanamo 1: 24-32. 1921.—It is shown that *Polygonum dumetorum* L. var. *apterum* Saelan is only a blighted individual of *P. dumetorum* in which *Ustilago anomala* had caused an imperfect development or complete absence of the wings of the outer calyx-lobes, the fungus not being visible outside the fruit. In *P. Convolvulus* L. the blight fungus, *Ustilago carnea* Liro n. sp. occurs occasionally although obscurely outside the fruit.—K. Linkola (translated).

4305. LOESENER, TH. Plantae Selerianae. X. Verhand. Bot. Vereins Brandenburg 65: 84-122. 1923.—The author gives a list of plants collected by Eduard Seler on his travels in Mexico, Central and South America while pursuing his ethnological studies. The following new species, varieties, and combination are included: *Dalea Caeciliae* Harms, *D. Loeseneriana* Harms, *D. querceti* Harms, *D. Seleriana* Harms, *Hesperothamnus pentaphyllus* Harms (*Sclerothamnus pentaphyllus* Harms), *Cestrum chaculanum*, *C. jacaltenanginum*, *C. perillambanum*, *Arrabidaea Seleriana*, *Adenocalymma alboriolaceum*, *A. Seleri*, *A. fissum*, *Rondeletia Seleriana*, *Bouvardia dolichantha*, *Manettia Seleriana*, *Randia aculeata* L. var. *chiapasina*, *R. tetramera*, *Basanacantha spinosa* (Jacq.) Schum. var. *guatemalensis*, *Mapouria Chamissoana*, *Palicourea mexicana* Benth. f. *angustifolia*, *P. macrantha*, *P. Seleri*, *Crusea brachyphylla* Cham. & Schlecht. f. *microcephala*, and *C. coccinea* DC. var. *breviloba*.—H. L. Blomquist.

4306. MACKENZIE, K. K. Proper use of the name *Leontodon*. Rhodora 27: 47-49. 1925.—The history of the name *Leontodon* is discussed and the conclusion reached that it must be used for the genus to which the dandelion belongs.—S. F. Blake.

4307. MACKENZIE, K. K. The genus *Erysimum*. Rhodora 27: 65-67. 1925.—Consideration of the history of the name *Erysimum* indicates that it should be used for the genus typified by *E. officinale* L.—S. F. Blake.

4308. MACKENZIE, K. K. The name *Sisymbrium*. Rhodora 27: 28-32. 1925.—The history of the name *Sisymbrium* is discussed, and the conclusion reached that it should be applied to the watercress.—S. F. Blake.

4309. MANSFIELD, R. Neue andine Labiati der Sammlung Weberbauer. [New Andean Labiates from the Weberbauer collection.] Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem. 9: 283-289. 1925.—All of the following plants are from Peru and are described as new to science: *Perilomia Weberbaueri*, *P. palambacensis*, *P. Briquetiana*, *P. Benthamiana*, *Satureia Weberbaueri*, *S. guamaniensis*, *S. Loeseneriana*, *S. mantaroensis*, *S. insignis*, and *Hyptis tafalloides*.—J. P. Young.

4310. MATTFELD, JOH. Zur Kenntnis der Formenkreise der europäischen und kleinasiatischen

ischen Tannen. [Distribution of European and Asia Minor firs.] Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem. 9: 229-246. 1925.—After full discussion of the characters and distribution of the several species involved, the author describes the new species, *Abies Borisii regis*, from Bulgaria, Thessaly, etc., and the new species, *A. Bornmülleriana*, from Asia Minor, Greece, etc. Letters from J. Bornmüller and H. Freiherr v. Handel-Mazzetti are appended.—J. P. Young.

4311. MERL, EDMUND M. Beiträge zur Kenntnis der brasilianischen Utricularien. [Brazilian Utricularias.] Flora 118-119: 386-392. 3 fig. 1925.—The author gives detailed descriptions of 2 Brazilian species of *Utricularia* collected by von Luetzelburg, namely, *U. Warmingii* Kam. and *U. Dusenii* Sylvén.—A. G. Stokey.

4312. MERRILL, E. D. An enumeration of Philippine flowering plants. Vol. 2, fasc. 1 and 2, p. 1-208. 1923.—A continuation of this work, fascicles 1 and 2 of volume 1 having previously been issued (see Bot. Absts. 12, Entry 6116). The present fascicles cover the Casuarinaceae to the beginning of the Capparidaceae, following the Engler and Prantl system. New names, combinations, and varieties appearing are as follows: *Parartocarpus Woodii* (*Gymnartocarpus Woodii* Merr.), *Artocarpus Blancoi* (*A. incisa* var. *Blancoi* Elm.), *Conocephalus grandis* (*Procris grandis* Wedd.), *Polychroa mindanaensis* (*Pellionia mindanaensis* C. B. Rob.), *P. volubilis* (*Procris volubilis* Elm.), *Elatostema Elmeri* (*E. pictum* Elm., non Hall. f.), *Elytranthe Elmeri* (*Loranthus Elmeri* Merr.), *Lepeostegeres alternifolius*, *L. amplifolius*, *L. banahaensis*, *L. capituliferus*, *L. congestiflorus*, *L. ovatifolius*, *L. tetranthus*, and *L. Williamsii* by transfer from *Loranthus*, *Bifaria Opuntia* (*Viscum Opuntia* Thunb.), *Desmos mindorensis*, *D. palawanensis*, and *D. rubra* by transfer from *Unona*, *Polyalthia Rumphii* (*Guatteria Rumphii* Blume), *Orophea ellipanthoides* (*Mitrephora ellipanthoides* Elm.), *Goniothalamus sibuyanensis* (*Uvaria sibuyanensis* Elm.), *Myristica lancifolia* (*Gymnacranthera lanceolata* Merr.), *M. negrosensis* (*G. negrosensis* Elm.), *M. urdanetensis* (*G. urdanetensis* Elm.), *Knema mindanaensis* (*Myristica mindanaensis* Warb.), *Actinodaphne bicolor*, *A. conferta*, *A. dolichophylla*, *A. samarensis* and *A. taybensis* by transfer from *Litsea*, *Litsea cinerea* (*Actinodaphne cinerea* Elm.), *Piper arborescens* Roxb. var. *hirtellum* (*Chavica miniata* var. *hirtella* Miq.), *P. brevicuspe* (*Rhyncholepis brevicuspis* Miq.), *Celtis rubrovenia* Elm. var. *integra*, *Allaeanthus luzonicus* (Blanco) F.-Vill. var. *glaber* (*A. glaber* Warb.), *Ficus perfulva* Elm., (*F. fulva* Elm., not Reinw.), *Vanieria grandifolia* (*Cudrania grandifolia* Merr.), *Artocarpus ovatifolius* Merr. var. *dolichostachys*, *Helicia Cumingiana* Presl var. *parvifolia*, *Deeringia polysperma* (Roxb.) Moq. var. *pubescens* (*D. indica* var. *pubescens* Schinz), *Polyalthia Elmeri* (*Unona miniata* Elm.), *P. mindorensis* (*Phaeanthus acuminatus* Merr.). Numerous reductions are made.—Author.

4313. MILDBRAED, J. Additamenta africana II. [African Additions II.] Commelinaceae. Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem. 9: 247-259. 1925.—Fifteen species are described, the following being new or previously mentioned without complete description: *Palisota megalophylla* and var. *robusta*, *P. lagopus*, *P. Waibelii*, *P. luxiflora* C. B. Clarke var. *annobonensis* Milbr., *P. gracilior* Milbr., *P. brachythyrsa* Milbr., *P. thyrsostachya* Milbr.; *Commelina velutina*, *C. Dinteri* Milbr., *C. macrospatha* Gilg & Ledermann, *C. Stolzii*, *C. triangulispata*; *Polyspatha hirsuta* and var. *togoensis*, *Buforesstia oligantha* Milbr., and *B. brachycarpa* Gilg & Ledermann.—J. P. Young.

4314. MILDBRAED, J. Plantae Tessmannianae peruvianae II. [Tessmann Peruvian plants.] Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem. 9: 260-268. 1925.—Twelve species are included of which the following are new and are described: *Anthurium Tessmannii* Krause; *Cecropia Tessmannii*; *Bauhinia Tessmannii* Harms; *Dioclea ucayalina* Harms; *Erythroxylum Tessmannii* O. E. Schulz; *Croton Tessmannii* Mansf.; *Caperonia zaponzeta* Mansf.; *Pera Mildbraediana* Mansf.; *Miconia Tessmannii* Markgraf; *Sanchezia cyathibractea*; and *Ruellia Tessmannii*.—J. P. Young.

4315. MOUSLEY, HENRY. Corallorrhiza maculata and its varieties in Canada. Canadian Field Nat. 39: 95-96. 1925.—The author discusses the varietal differences in the material available.—H. Groh.

4316. NAKAI, T. Genera nova Rhamnacearum et Leguminosarum ex Asia orientali. [New genera of Rhamnaceae and Leguminosae from eastern Asia.] Bot. Mag. Tokio 37:

29-34. 1923.—The writer describes a new genus of Rhamnaceae, *Berchemiella*, which includes *B. Wilsonii* (*Chaydaia Wilsonii* Schneid.) and *B. berchemiaefolia* (*Rhamnella berchemiaefolia* Mak.) and the new genus *Echinosophora* of Leguminosae, giving a new combination, *E. koreensis* (*Sophora koreensis* Nakai).—*T. Fukushi*.

4317. NILES, CORNELIA D., AND AGNES CHASE. A bibliographic study of Beauvois' Agrostographie. Contrib. U. S. Nation. Herb. 24: 135-214. 1925.—This paper presents a synopsis and identification according to modern nomenclature of the new names published in Palisot de Beauvois' "Essai d'une Nouvelle Agrostographie," a fundamental work in the study of grasses. The bibliographical portion of the paper is by Miss Niles, the introduction and botanical notes by Agnes Chase. A summary of Beauvois' Essay, with his table of groups and genera, is followed by a classification of his genera according to Hackel's system and by a list of all his new names with their modern equivalents. The paper closes with a short biographical sketch of Beauvois, and a note on his own annotated copy of the Essay, now in the library of the U. S. Department of Agriculture. The following new names appear: *Chaetochloa longiseta* (Beauv.) Chase, *Chamaeraphis squarrosa* (L. f.) Chase, *Desmazeria uniolae* (L. f.) Chase, *Paspalum ceresia* (Kuntze) Chase, *Rhaphis elongatus* (R. Br.) Chase, *R. parviflora* (R. Br.) Chase, *Schismus barbatus* (L.) Chase, *Syntherisma gibbosa* (R. Br.) Chase.—*S. F. Blake*.

4318. OETTINGEN, H. VON. Kritische Betrachtungen über die Systematik der Gattung *Poa* L., besonders über die Sektion *Pachyneurae* Aschers. [A critical review of the taxonomy of the genus *Poa*, especially the Section *Pachyneurae*.] Repert. Spec. Nov. Regni Veg. 21: 306-316. 1925. (Repert. Eur. et Med. 1: 722-732. 1925).—A new species is described, *Poa athroostachya*, from Flachland in North Germany, and a comparative table is given of *P. pratensis* L., *P. athroostachya*, *P. Chaixii* Vill., *P. remota* Forsk., and *P. hybrida* Gaud.—*John E. Dinsmore*.

4319. PARKER, R. N. The genus *Sonneratia*. Indian Forest. 51: 505-510. 1925.—There is much confusion in the species due to variations and use of characters that are not stable. The described characteristics are here assembled for the various species with data on the conflicting items, indicating the degree of importance to be attached to each.—*E. N. Munns*.

4320. PAU, CARLOS. Contribución a la flora Española. Plantas de Almería. [Contribución to the flora of Spain. Plants of Almería.] Mem. Mus. Cienc. Nat. Barcelona. Ser. Bot. 13: 1-34. Pl. 1-4. 1925.—The present number consists of an annotated list of 346 species of vascular plants of southern Spain. The following are indicated as new: *Alyssum Cadevallium*, *Camelina silvestris* Wallr. var. *mediterranea*, *Helianthemum almeriense*, *Anthyllis media* (*A. cytisoides* × *terniflora*), *Astragalus Grossi*, *A. Tremolsianus*, *Launaea lanifera*, and *Teucrium serranum*.—*J. M. Greenman*.

4321. PEATTIE, DONALD CULROSS. Casuarinas of America identified by branchlets and seeds. Jour. Washington [D. C.] Acad. Sci. 15: 345-346. 1925.—A key, based on the characteristics of branchlets and seeds, is submitted.—*Helen M. Gilkey*.

4322. RADLKOFER, L. Sapindaceae tres javanicae novae e tribu Nepheliearum. [Three new Javanese Sapindaceae of the tribe Nephelieae.] Flora 118-119: 399-401. 1925.—*Pseudonephelium javanicum*, *Xerospermum xanthophyllum* and *Nephelium maculatum* are described as new species.—*A. G. Stokey*.

4323. REHDER, ALFRED. New species, varieties, and combinations from the herbarium and the collections of the Arnold Arboretum. Jour. Arnold Arboretum 6: 201-208. 1925.—This article contains a new species, a new hybrid, new varieties and new combinations: *Quercus Stewardii*, × *Taxus Hunnebelliana*, *Juniperus chinensis* L. var. *japonica* Lav. f. *alba* (Standish), *J. horizontalis* f. *glomerata*, f. *alpina* (Loud.) and f. *plumosa*, *Abies alba* Mill. f. *compacta* (Parsons), *Cedrus libanotica* Link f. *glauca* (Knight & Perry), f. *nana* (Loud.) and f. *pendula* (Knight & Perry), *Salix Matsudana* f. *umbraculifera*, f. *tortuosa*, × *Ulmus hollandica* var. *Dauvessei* (Nichols.), *Ribes sativum* Syme f. *variegatum* (West) and f. *striatum* (Ktze.), *Hamamelis japonica* var. *flavo-purpurascens* (Mak.).—*Alfred Rehder*.

4324. ROBINSON, B. L. Records preliminary to a general treatment of the Eupatorieae, V. Contrib. Gray Herb. 75: 3-15. 1925.—As a result of the study of much herbarium material loaned from the herbaria of Europe and America, the author gives a continuation of his study

of the American Eupatorieae. The following new species, new combinations, and varieties are described: *Ophryosporus petraeus* (*Eupatorium petraeum* Robinson), *O. scabrellus* (*Eupatorium scabrellum* Robinson), *Eupatorium Bakerianum* (*E. cinereum* Bak., not L.), *E. calophyllum* (*Kyrstenia calophylla* Greene), *E. Espinosarum* var. *doratophyllum* (*E. Robinsonianum* Greene), *E. etlense*, *E. eucosmoides*, *E. hebes*, *E. hebes* var. *typicum* and var. *rasum*, *E. hidalgense*, *E. irrasum*, *E. ligustrinum* DC. var. *typicum* and var. *villiferum*, *E. odontodactylum*, *E. Orelegae*, *E. porriginosum*, *E. rhodopodum*, *E. subintegrum* (*E. Espinosarum* var. *subintegrifolium* Robinson), *E. thysanolepis*, *E. ymalense*, and *Kanimia goyazensis*. A few other species are critically discussed.—*E. B. Payson*.

4325. RONNIGER, K. Beiträge zur Kenntnis der Gattung Thymus. I. [Contributions to the genus Thymus. I.] Repert. Spec. Nov. Regni Veg. 20: 321-332. 1924. (Repert. Eur. et Med. 1: 641-652. 1924.)—This 1st paper has to do with British species and forms. Three new species are described in Latin and numerous localities given for each: *T. Drucei*, *T. neglectus*, and *T. britannicus*, the authority for each being Ronniger. One new hybrid is given: *T. pulegioides* × *pycnotrichus* (*T. Henryi* Ronniger).—*John E. Dinsmore*.

4326. RONNIGER, K. Beiträge zur Kenntnis der Thymus-Flora der Balkanhalbinsel. I. [Contributions to the knowledge of the genus Thymus in the Balkan Peninsula. I.] Repert. Spec. Nov. Regni Veg. 20: 334-336. 1924. (Repert. Eur. et Med. 1: 654-656. 1924.)—The following new combinations and forms are given: *Thymus heterotrichus* Griseb. f. *pusillus* from the Doiran district; *T. Toševii* Vel. var. *longifrons* from Prilep, etc., *T. longedentatus* (Degen & Urumoff) Ronn. = *T. zygioides* Gris. var. *longedentatus* Deg. & Ur.—*John E. Dinsmore*.

4327. RONNIGER, K. Beiträge zur Kenntnis der Thymus-Flora der Balkanhalbinsel. II. [Contributions to the knowledge of the genus Thymus in the Balkan Peninsula. II.] Repert. Spec. Nov. Regni Veg. 20: 385-390. 1924. (Repert. Eur. et Med. 1: 657-662. 1924.)—The following new species and varieties are described: *Thymus doiraniensis*, from the Doiran district; *T. belgradiensis*, from Belgrade; *T. lanicaulis*, from Uesküb; *T. alšarensis*, from Alšar; *T. longicaulis* Presl var. *Freynii* (*T. dalmaticus* Freyn); *T. adriaticus* Vel. ined., from the island of Lussin in Dalmatia; *T. poliothrix*, from the Sar-dagh district. All of these, unless otherwise indicated are by Ronniger and noted as "ined."—*John E. Dinsmore*.

4328. RONNIGER, K. Thymus praecox Opiz subsp. (nov.) filicaulis Ronn. et Bornm. e flora Thuringiaca. [Thymus praecox Opiz subsp. (nov.) filicaulis Ronn. & Bornm. from Thuringia.] Repert. Spec. Nov. Regni Veg. 20: 66-67. 1924. (Repert. Eur. et Med. 1: 626-627. 1924.)—This new subspecies is described in Latin.—*John E. Dinsmore*.

4329. RYDBERG, P. A. Some extinct or lost and rediscovered plants, II. *Astragalus labradoricus* DC. Torrey 25: 96-98. 1925.—*Astragalus secundus* Michx. was first described in 1803; its name was changed to *A. labradoricus* DC. in 1825. It then seems to have been lost for almost a century although Jones in a revision of the genus erroneously regarded it as synonymous with *A. Blakei* Eggleston, *A. Robbinsii* var. *Jesupi* Sheld. and *A. Macounii* Rydb. It now seems to be matched exactly by the type sheets of Fernald's *A. alpinus* var. *Brunetianus* (Fernald 24).—*Wm. G. McGinnies*.

4330. SAUNDERS, W. E. Unusual forms of *Trillium grandiflorum*. Canadian Field Nat. 39: 149. 1925.—Owing to the occurrence of aberrant forms in an area bordering on Lake Erie, a modified description of the species is proposed.—*H. Groh*.

4331. SCHLECHTER, R. Plantae sinenses a H. Smith 1921-22 lectae V. Orchidaceae. [Plants of China collected in 1921-22 by H. Smith, V. Orchidaceae.] Acta Hort. Gothoburg. 1: 125-155. 1924.—The author describes as new (nearly all from northern Szechuan): *Cypripedium calcicolum*, *C. nutans*, *C. Smithii*, *Orchis diantha*, *O. spathulata* Rehb. f. var. *Wilsonii*, *Amitostigma nivale*, *A. physoceras*, *Herminium nivale*, *Neottianthe compacta*, *Platanthera minutiflora*, *Habenaria acianthoides*, *H. pubicaulis*, *H. szechuanica*, *Neottia acuminata*, *N. dongrergoensis*, *Listera biflora*, *L. Smithii*, *Epipactis monticola*, *Cephalanthera szechuanica*, *Goodyera serpens*, *Pleione Smithii*, *Oreorchis nana*, and *Tipularia szechuanica*. The systematic position of the new species is discussed in all cases.—*C. Skottsberg*.

4332. SCHULZ, O. E. Ergänzungen zu dem Artikel: *Schivereckia korabensis* in den Ostalpen. [Supplement to the article: *Schivereckia korabensis* in the Eastern Alps.] Repert.

Spec. Nov. Regni Veg. 20: 65, 66. 1924. (Repert. Eur. et Med. 1: 625, 626. 1924.)—The author here declares that the plant spoken of in a preceding paper (see this issue, Entry 4334), is not *korabensis* but should be named *Schivereckia Wiemannii* O. E. Schulz (collected by Wiemann), and that the real *S. korabensis* is a plant now in the Berlin Museum, marked *Draba Doerfleri* Wettst. from Bulgaria.—*John E. Dinsmore.*

4333. SCHULZ, O. E. *Plantae sinenses a H. Smith 1921-22 lectae VI. Cruciferae. [Plants of China collected in 1921-22 by H. Smith, VI. Cruciferae.] Acta Hort. Gothoburg. 1: 157-167. 1924.*—The following new species are proposed: *Erysimum szechuanense*, *Cardamine glaphyropoda*, *Loxostemon Smithii*, *Draba remotiflora*, all from northern Szechuan. *Hesperis Limprichtii* O. E. Sch. var. *violacea* is described from Chili.—*C. Skottsberg.*

4334. SCHULZ, O. E. *Schivereckia korabensis* (Kümm. et Deg.) O. E. Schulz in den Ostalpen. [*Schivereckia korabensis* (Kumm. & Deg.) O. E. Schulz in the Eastern Alps.] Repert. Spec. Nov. Regni Veg. 19: 335, 336. 1924. (Repert. Eur. et Med. 1: 623-624. 1924.)—This is a new combination for the name of a plant originally described as *Draba Thomasii* A. v. Hayek.—*John E. Dinsmore.*

4335. SKOTTSBERG, C. *Bemerkungen zu einigen Chloraea- und Asarca-Arten. [Remarks on some species of Chloraea and Asarca.] Acta Hort. Gothoburg. 1: 211-224. 7 fig. 1924.*—Critical notes on several species of 2 Chilean-Patagonian orchid genera, mainly based on studies of type material in the Santiago Museum. *Chloraea inconspicua* R. A. Phil., regarded by Reiche as identical with *C. Foncki* Kränzl., is restored. Kränzl's views (as expressed in his monograph) on some species of *Asarca* are criticized. A new description, based on the type at Kew, of *Asarca Kingii* Hook. f. is given. *A. enigmatica* Haum. is regarded as identical with *A. australis* Skottsberg.—*C. Skottsberg.*

4336. SKOTTSBERG, CARL. *The phanerogams of Easter Island. Nat. Hist. Juan Fernandez and Easter Island [Ed. by C. Skottsberg] 2: 61-84. Pl. 6-9. 2 fig. 1922.*—The author records as collected by himself 30 apparently indigenous species, of which 12 were collected for the first time. Three grasses are described as new: *Axonopus paschalis* Pilger, *Stipa horridula* Pilger and *Danthonia paschalis* Pilger. *Sophora toromiro* Skottsberg. (*Edwardsia toromiro* R. A. Phil.) is restored as a species and the differences between this and both New Zealand and Chilean *Edwardsias* are pointed out. Among the 6 apparently wild or semi-wild species, suspected to have been intentionally introduced on account of their useful properties, 1 species is proposed as new: *Solanum insulae-paschalis* Bitter. Finally, 39 weeds are listed. The author points out the existence of a small American element in the wild flora.—*Author.*

4337. SKOTTSBERG, CARL. *The phanerogams of the Juan Fernandez Islands. Nat. Hist. Juan Fernandez and Easter Island [Ed. by C. Skottsberg] 2: 95-240. Pl. 10-20. 39 fig. 1922.*—After the 2 visits of the author (1908, 1916-1917), 142 indigenous species are known from the Juan Fernandez group. Of these, 27 are found in both Masatierra (with Santa Clara) and Masafuera, 65 are confined to the former and 45 to the latter. Of the remaining 5 species, 4 occur on Masatierra and the rock Santa Clara, but are absent in Masafuera, while 1 is restricted to the rock. The considerable difference between the 2 islands, only 90 miles apart, is noteworthy. Of the genera, 81 in number, 10 are endemic, all except 1 occupying a very independent position within their respective families. Of the 142 species, 98, or 69%, are endemic. Further discussion on distribution and endemism is postponed to a coming paper. The author has discovered 31 species, not known before from the islands, many also being new to science. The following new species and combinations are proposed, the author being Skottsberg, if not otherwise stated: *Bromus fernandezianus* (*Megalachne Berteroniana* Steud.), *Pantathera fernandeziana* R. A. Phil., *Bromus megalachne* Pilger), *Greigia Berteroi*, *Luzula racemosa* Desv. subsp. *insularis*, *Chenopodium Crusoeanum*, *C. nesodendron*, *Spergularia confertiflora* Steud. var. *polyphylla* (*Arenaria rubra* var. *polyphylla* R. A. Phil.) and var. *glaberrima*, *Ranunculus caprarum*, *Berberis masafuerana*. *Margyraea* Bitter n. hyb. gen., *M. Skottsbergii* Bitter (*Acaena argentea* R. & P. \times *Margyricarpus setosus* R. & P. subsp. *digynus* Bitter), *Sophora fernandeziana* (*Edwardsia fernandeziana* R. A. Phil.) with var. *Reedeana* (*S. Reedeana* R. A. Phil.), *S. masafuerana* (*Edwardsia masafuerana* P. A. Phil.), *Fayara externa*, *Halorrhagis asperima* (*H. erecta* var. *scabra* Skottsberg.), *H. masati-*

rana (*H. erecta* (Murr.) Schindl. p. p.), *H. masafuerana*, *Eryngium inaccessum*, *Rhaphithamnus venustus* (*Citharexylon venustum* R. A. Phil., *R. longiflorus* Miers), *Solanum masafueranum* Bitter & Skottsb., *Mimulus parviflorus* Lindl. var. *externa*, *Euphrasia formosissima*, *Coprosma pyrifolium* (*Psychotria pyrifolia* Hook. & Arn.), *Galium masafueranum*, *Wahlenbergia Larrainii* (*Campanula Larrainii* Bert. ex Colla), *Erigeron luteoviridis*, *E. Ingae* var. *innocentium*, *E. turricola*, *Abrotanella crassipes*, *Robinsonia Masafueræ*, *Dendroseris macrantha* (*Rea macrantha* Bert.), *D. litoralis*, *D. regia*, *D. pruinata* (*D. micrantha* var. *pruinata* Johow). Special attention is given to the taxonomy of *Halorrhagis*, *Robinsonia*, and *Dendroseris*, and analytical keys are added. All the new species and a number of little known old ones are figured. A list of 130 introduced species concludes the paper.—*Author*.

4338. SMALL, JOHN K. An additional *Anychia* from Pennsylvania. *Torreya* 25: 59-61. 1925.—*Anychia Nuttalli*, found in the mountains of southern Pennsylvania, is described as a new species.—*Wm. G. McGinnies*.

4339. SMALL, JOHN K. A new varnish-leaf tree from the Florida Keys. *Torreya* 25: 38-39. 1925.—*Dodonaea microcarya* from Big Pine Key, Florida, is described as a new species.—*Wm. G. McGinnies*.

4340. SMALL, JOHN K. A new whitlow-wort from Florida. *Torreya* 25: 11-12. 1925.—*Nyachia pulvinata* n. gen. and sp. from the southern end of the lake region of Florida are described.—*Wm. G. McGinnies*.

4341. SMITH, HARRY. *Plantae sinenses a H. Smith 1921-22 lectae I.* [Plants of China collected in 1921-22 by H. Smith I.] The genus *Saxifraga*. *Acta Hort. Gothoburg.* 1: 1-22. Pl. 1-10, 5 fig. 1924.—Smith collected mainly in western China, province of Szechuan. He is the author of the following new forms of *Saxifraga*: *S. flagrans* and var. *platyphylla*, *S. heleonastes*, *S. montana* and var. *splendens*, *S. Diapensia*, *S. pseudohirculus* Engl. var. *tenuiflora*, *S. cacinumum*, *S. glacialis*, *S. pumila*, *S. angustata*, *S. propagulifera*, *S. sibirica* L. var. *bulbillifera*, *S. saxatilis*, and *S. octandra*, all figured. It is shown that true *S. Hirculus* L. does not occur in Tibet or China, where it is replaced by the closely allied *S. montana* H. Sm.—*C. Skottsberg*.

4342. SMITH, J. J. Die Orchideen der zweiten Frankfurter Sunda-Expedition. 1909-1910. [The orchids of the second Frankfort Sunda Expedition 1909-1910.] *Mededeel. Rijks Herb.* 53: 1-17. 1925.—The following new species are delimited: *Peristylus rindjaniensis*, Lombok, on the Rindjani, north slope, near Tengengeah, 1300-1450 m.; *P. Elbertii*, Lombok, on the Rindjani, north-northeast side, Kalimati near Sembaloen, 1250-1350 m., mountain meadows; *Calanthe pauciverrucosa*, Soembawa, Batoe-Lanteh Mountains, north side, 1500-1700 m.; *Oberonia Elbertii*, Lombok, on the Rindjani, north side near Tengengeah, 1300-1450 m.; *Ceratostylis longipedunculata*, Lombok, on the Rindjani, southwest side near Sangkareang, 700-1700 m., and other places; *Dendrobium rindjaniense*, Lombok, on the Rindjani, north side near Segara Anak, 1925-2000 m., Crater Lake region; *Eria exappendiculata*, Lombok, on the Rindjani, northeast side, Sembaloen plateau, 1185-1265 m.; *Thrixspermum lombokense*, Lombok, on the Rindjani, southwest side near Sangkareang, 700-1700 m.; *Saccolabium erosulum*, Lombok, on the Rindjani, north side near Tengengeah, 1300-1400 m.; *Vanda lombokensis*, Lombok, on the Rindjani, northeast side, Sembaloen plateau, surrounded by old crater-ring wall, 1185-1265 m.; *Sarcanthus sumbawensis*, Soembawa, Kowanko on the Saleh-Bai, 10-100 m., river valley; and the following variety, *Dendrobium eriiflorum* Griff. var. *lombokense*, Lombok, on the Rindjani, north-northeast side, Kalimati, near Sembaloen, 1250-1350 m., mountain meadow, also Elenda, north side, below Tengengeah, 900-1350 m.—*M. F. L. Fitzpatrick*.

4343. STANDLEY, PAUL C. An enumeration of the Sapotaceae of Central America. *Tropical Woods* 4: 1-11. 1925.—This is a provisional list of the species that have been reported from the region, including Panama and Yucatan. The following new species are described: *Lucuma hypoglauca*, *L. amygdalina*, *L. Durlandii*, *L. izabalensis*, *L. belizensis*, *Bumelia guatemalensis*, and *B. panamensis*.—*W. N. Sparhawk*.

4344. STANDLEY, PAUL C. New plants from Central America—II. *Jour. Washington (D. C.) Acad. Sci.* 15: 101-107. 1925.—The following new species from the Canal Zone, Costa Rica, and Salvador, are described: *Inga gracilipes*, *Anaxagorea panamensis*, *Annona*

Hayesii, *Unonopsis Pitteri*, *Trichilia unifoliola* Blake & Standl., *Bernardia macrophylla*, *Opuntia salvadorensis* Britt. & Rose, *Evea guapilensis*, *Evea nana*, *Psychotria chagrensis*, *Diodia denudata*, *Vernonia Lankesteri*; and *Tontanea glabra* (Bartl.) Standl. is the new combination for the former *Coccocipsilum glabrum* DC., described from Panama specimens over a century ago, and only recently rediscovered.—*Helen M. Gilkey*.

4345. STANDLEY, PAUL C. New plants from Central America, III. Jour. Washington [D. C.] Acad. Sci. 15: 285-289. 1925.—The following new species are described and new combinations made: *Xylopia xylopioides* (Dunal) Standl., *Colubrina heteroneura* (Griseb.) Standl., *Dolioscarpus multiflorus*, *D. punctatus*, *D. dentatus* (Aubl.) Standl., *Hybanthus anomalus* (HBK.) Standl., *Eugenia Zetekiana*, *Watsonamra Alfaroana*, *Psychotria Tonduzii*, *P. Torresiana*, *P. Jimenezii*, *P. orosiana*, *P. Siggersiana*.—*Helen M. Gilkey*.

4346. ULBRICH, E. Ranunculaceae novae vel criticae VII. Ranunculaceae asiaticae. [Ranunculaceae new or critical VII. Asiatic Ranunculaceae.] Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem. 9: 209-228. 1925.—This treatment of 11 species is given to meet difficulties encountered, especially with Isopyreae, in classifying several collections from east and central Asia. Unfortunately the author was unable to see the collection made by Smith of the Arnold Arboretum in eastern Asia. The following names are new in some feature. *Paraqueilegia anemonoides* (Willd.); *Paropyrum* n. gen., *Paropyrum anemonoides* (Kar. & Kir.); *Isopyrum flaccidum*; *Thalictrum umbricola*, *T. Faberii*, *T. Giraldii*, *T. laxum*; *Pulsatilla millefolium* (Hemsl. & Wils.).—*John P. Young*.

4347. VALCKENIER SURINGAR, M. J. Le nom Walikoekoen *Schoutenia ovata* Korthals ou *Actinophora fragrans* Wallich? [The name of the Walikoekoen *Schoutenia ovata* Korthals or *Actinophora fragrans* Wallich?] Mededeel. Rijks Herb. 48: 1-10. 7 fig. 1925.—After considerable research concerning the history of the nomenclature of *Schoutenia ovata* Korthals and *Actinophora fragrans* Wallich, the author decides in favor of *Schoutenia ovata* as this name has the right of priority. Walikoekoen is the popular name of this plant which is native to Java.—*M. F. L. Fitzpatrick*.

4348. VALCKENIER SURINGAR, M. J. Additions à mon article "Le nom du Walikoekoen *Schoutenia ovata* Korth. ou *Actinophora fragrans*" (Wall.) R. Br.? [Additions to my article "The name of the Walikoekoen *Schoutenia ovata* Korth. or *Actinophora fragrans*" (Wall.) R. Br.?] Mededeel. Rijks Herb. 49: 1-5. 1925.—In this article the author gives further proof of the authenticity of the name *Schoutenia ovata* Korthals. (See also preceding Entry.)—*M. F. L. Fitzpatrick*.

4349. VESTERGREN, T. *Agropyron litorale* (Host.) Dum., en mediterranean-atlantisk art vid nordeuropas kuster. [Agropyron litorale (Host.) Dum., a Mediterranean-Atlantic species on the shores of north Europe.] Svensk Bot. Tidskr. 19: 263-288. 5 fig. 1925.—Detailed descriptions are given of *Agropyron litorale* and the 2 hybrids, *A. junceum* × *litorale* and *A. litorale* × *repens*. The author reports the pure species from several places on the Swedish west coast, in Denmark and northern Germany. The 2 hybrids that are quite sterile have hitherto been mistaken for *A. junceum* × *repens*. Both are reported from several places along the shores of Sweden, Finland, Denmark and Germany, the latter one also in Norway. The hybrids thus occur in places where one or both of the parents are lacking. They have probably often been carried to their present habitats by man, for instance through ballast-sand. Notes on history and nomenclature end the work.—*O. Heilborn*.

4350. WEATHERBY, C. A. *Gaura parviflora* Dougl., var. *lachnocarpa*, n. var. *Rhodora* 27: 14-15. 1925.—*Gaura parviflora* var. *lachnocarpa*, distinguished from the typical form by its pubescent hypanthium and fruit, is described, with a range from Alabama to Mexico and Lower California.—*S. F. Blake*.

4351. WEIN, K. *Papaver strigosum* (Bönnigh.) Schur var. *umbiliciferum* K. Wein. Repert. Spec. Nov. Regni Veg. 20: 333-334. 1924. (Repert. Eur. et Med. 1: 653-654. 1924.)—A new variety of *P. strigosum*, from northern Thuringia, in Germany, is described.—*John E. Dinsmore*.

4352. WHERRY, EDGAR T. A new acid-soil onion from West Virginia. Jour. Washington [D. C.] Acad. Sci. 15: 370-372. Fig. 1-2. 1925.—*Allium oxyphilum*, a close relative of *A. cernuum* Roth but with distinct characteristics and a fondness for acid soil habitats, is described as a new species.—*Helen M. Gilkey*.

4353. WIEGAND, K. M. Some changes in nomenclature. *Rhodora* 27: 186-187. 1925.—*Sagittaria latifolia* Willd. var. *obtusata* (Muhl.) and *Armoracia aquatica* (Eaton) are new names. Under *Polygonum Muhlenbergii* (Meisn.) Watson f. *natans* Wiegand, the author states that the type assigned when this form was described belongs to a similar form of *P. amphibium*, and accordingly designates a new type specimen.—*S. F. Blake*.

4354. WILSON, ERNEST H. *Rhododendron chrysocalyx* Lév. & Vaniot. *Jour. Arnold Arboretum* 6: 200-201. 1925.—A full description of this rare species incompletely described by its authors is here given, based on the type specimens.—*Alfred Rehder*.

4355. WOLFF, H. Neue Umbelliferen-Gattungen aus Ostasien. [New genera of Umbelliferae from eastern Asia.] *Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem* 9: 275-280. 1925.—The following new genera and species are described: *Chamaesium* n. gen., *C. paradoxum*; *Physospermopsis* n. gen., *P. Delarayi* (*Arracacia Delarayi* Franch.); *Sinodielsia* n. gen., *S. yunnanensis*; *Tongoloa* n. gen., *T. gracilis*.—*J. P. Young*.

4356. WOLFF, H. *Scaligeria Aitchisonii* species nova patriae ignotae. [A new species of *Scaligeria* from an unknown country.] *Repert. Spec. nov. Regni Veg.* 21: 109-110. 1925. (*Repert. Eur. et Med.* 1: 685-686. 1925.)—This new species, in the Kew Herbarium, but without locality or number, is described in Latin.—*John E. Dinsmore*.

4357. WOLFF, HERMANN. *Stefanoffia*, eine neue Umbelliferen-Gattung von der Balkanhalbinsel und aus Kleinasien. [*Stefanoffia*, a new genus of Umbelliferae from the Balkan Peninsula and Asia Minor.] *Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem* 9: 281-282. 1925.—A new generic name, *Stefanoffia*, is given to the plant hitherto known as *Carum daucoides* Boiss. The new genus is monotypic.—*J. P. Young*.

4358. WOLFF, H. Umbelliferae novae Asiae minoris. I. [New Umbelliferae from Asia Minor. I.] *Repert. Spec. Nov. Regni Veg.* 20: 67-69. 1924. (*Repert. Eur. et Med.* 1: 627-629. 1924.)—*Ferulago cypria* from Cyprus, *Peucedanum Urbanii* Freyn & Sint. msc. from the Troad, and *P. Sinteniesii* from Transcaspiia near Persia, are here described in Latin.—*John E. Dinsmore*.

4359. WOLFF, H. Umbelliferae novae Asiae minoris. II. [New Umbelliferae from Asia Minor. II.] *Repert. Spec. Nov. Regni Veg.* 21: 110-111. 1925. (*Repert. Eur. et Med.* 1: 686-687. 1925.)—The following are described: *Ferulago insularis*, from the island of Samos, and *F. brachycarpa* Boiss. var. *trojana* from Mt. Ida in the Troad.—*John E. Dinsmore*.

4360. YAMAMOTO, YOSIMATU. Eine neue Art von Anoectochilus. [A new species of *Anoectochilus*.] *Bot. Mag. Tôkyô* 38: 131-133. 12 fig. 1924.—A new species of orchid, *Anoectochilus yakushimensis*, from the Island of Yakushima southern Japan, is described and illustrated.—(*Courtesy of Japanese Jour. Bot.*)

4361. YAMAMOTO, YOSIMATU. Genus novum Orchidacearum ex Formosa. [A new genus of the Orchidaceae from Formosa.] *Bot. Mag. Tôkyô* 38: 209-214. 12 fig. 1924.—Latin descriptions of the new genus *Tuberolabium* and of the new species *T. kotoense* are given and these are supplemented by illustrations of the type material.—(*Courtesy Japanese Jour. Bot.*)

4362. ZAMELS, A. *Pulsatilla wolfgangiana* Besser et *Pulsatilla teklae* Zamels sp. n. *Compt. Rend. Soc. Biol.* 92: 877-881. 1 fig. 1925.—The latter species is separated from the former and described. Reasons are given.—*Oran Raber*.

REVISIONS AND MONOGRAPHS

4363. BAILEY, L. H. Enumeration of the Eubati (Dewberries and blackberries) native in North America. *Gentes Herb.* 1: 203-300. Fig. 91-139. 1925.—The enumeration of the groups and species is preceded by an introduction discussing chiefly the difficulty of arriving at a satisfactory taxonomic understanding and disposition of the numerous forms of this polymorphous genus, and the question of hybridity in regard to which the author asserts that hybridity is too often assumed without sufficient proof. A key to the 11 groups of American *Eubati* distinguished is given, and under each group there is a key to the species of which there are 77 in all. Only the new species and new varieties are described, but under each species the author discusses in detail its affinity, distribution, peculiarities, and other noteworthy facts. The following species, varieties and combinations are new: *Rubus titanus*

and var. *espinatus*, *R. okeechobeus*, *R. ictus*, *R. mirus*, *R. flagellaris*, var. *geophilus*, *R. nefrens*, *R. rhodinsulanus*, *R. vigil*, *R. jacens*, var. *Blanchardianus* and var. *specialis*, *R. setosus*, var. *Groutianus*, *R. miscix*, *R. montpelierensis*, *R. fraternalis*, *R. cuneifolius*, var. *angustior*, *R. inferior*, *R. rosarius*, *R. ucetanus*, *R. argutus*, var. *scissus*, *R. tallahasseeanus*, *R. ithacanus*.—Alfred Rehder.

4364. CAMMERLOHER, H. Die *Cinnamomum*-Arten von Niederländisch-Ostindien. [The species of *Cinnamomum* of the Dutch East Indies.] Bull. Jard. Bot. Buitenzorg III. 7: 446-497. Fig. 1-13. 1925.—A revision is given of the species of *Cinnamomum* of the Dutch East Indies, with a key to the species. Of each species a full description is given, the literature cited and the specimens examined enumerated; the illustrations are mostly full-page drawings of specimens. The following species are new: *Cinnamomum pendulum*, *C. pilosum*, *C. Koordersi*, *C. coriaceum*, and *C. grandifolium*.—Alfred Rehder.

4365. CUȘULEAC, M. Beiträge zur Systematik der *Anchuseae*. [Contributions to the taxonomy of the *Anchuseae*.] Bul. Științe Nat. 26: 79-92. 3 fig. 1923. (Publicațiunile Societății Naturaliștor din România No. 6).—After a detailed description of the characters of the *Anchuseae* the following genera are submitted, to which a determination-key in Latin is given: *Trigonocaryum* Trautv.; *Hormuzakia* n. gen. (*Anchusa* in part Lehm. et al.), based on *Hormuzakia aggregata* from Egypt; *Gastrocotyle* Bge.; *Bothriospermum* Bge. in part (excl. *B. tenellum*, which is not a *Bothriospermum*); *Pentaglottis* Tausch. (*Caryolopha* Fisch. & Tr.); *Brunnera* Stev. (*Anchusa* Sect. *Myosotoides* DC.); *Nonnea* Moench. (*Oskampia* Moench.); *Symphytum* L.; *Anchusa* L. em. Cușul.; *Borago* L.; *Trachystemon* Don (*Psilostemon*). Within the genus *Anchusa* 2 new monotypic subgenera, *Dimonia* and *Cynoglottis*, are distinguished and characterized in Latin.—Al. Borza (translated).

4366. DAHLSTEDT, H. *Taraxaca* från Västra Norge. [Taraxaca from western Norway.] Bergens Mus. Aarb. (Naturv. række No. 6.) 1923-1924: 1-39. Bergen, 1925.—In the present studies on *Taraxaca*, 15 new species and 1 variety are described, namely *Taraxacum acroglossoides*, *T. adiantifrons*, *T. ancistrolobum*, *T. convexum*, *T. craspedotum*, *T. granvicense*, *T. hilare*, *T. laetecolorans*, *T. Landmarkii*, *T. occidentale*, *T. oncolobum*, *T. panuncium*, *T. angustisquamum* var. *pholidotum*, *T. piceaticeps*, *T. Sellandi* [i], *T. sinuatum*. The probability of the spreading through human agencies is emphasized. A number of species, *T. spectabile*, *T. eximium*, the *croceum* group, *T. faeroeense*, *T. naevosiforme* and *T. naevosum* have at present a very peculiar alpine distribution in Scandinavia, and the author thinks it probable that they were found in the Scandinavian flora before the last glacial period. During that period they should have survived south and southwest of the ice-edge, perhaps even on nunataks, and have re-immigrated after the melting of the ice to their present areas of distribution.—K. Münster Strøm.

4367. DECANDOLLE, CASIMIR. *Piperacearum Clavis Analytica*. [Analytical key of the *Piperaceae*.] Candollea 1: 65-415. 1923.—The introduction explains that in the later years of his life, DeCandolle had given much attention to a general key to the species of *Piperaceae*. At the time of his death in 1918, the key had been completed and also a list of the species. For typographical reasons the editors (RAYMOND DE CANDOLLE and R. BUSER) have modified the form of the key left by the author but no essential changes have been made. Four genera are included, one, *Piperanthera*, consisting of a single species, *P. cupularis* (Urb.) C.DC., and another, *Verhuellia*, was taken up in Urban's *Symbolae Antillanae* (3: 216) to which the reader is referred. The general key consists of 2 parts, the keys to the subgenera and species of *Piper*, followed by an alphabetical index of the species, and the key to the species of *Peperomia* followed by an index.—The following new species and varieties are included: *Piper acutistigmum* (Burma), *P. aduncum* var. *laevilimbium* (Panama), *P. amplilimbium*, *P. arborigaudens* (Khasia), *P. aurantiacum* var. *hupeense* (China), *P. austrocaledonicum* var. *digynium* (Mcoré), *P. barbulatum* (Costa Rica), *P. bengalense* (India), *P. Bette* var. *psilocarpum* (China), *P. betleoides* (Sikkim), *P. Boerlagei* (Amboina), *P. brevilimbium* (Guatemala), *P. caducibracteum* (Amhon), *P. calvilimbium* (Sikkim), *P. caninum* var. *membranaceum* (Sumatra), *P. capitellatum* (New Guinea), *P. carnistigmum* (India or.), *P. caudilimbium* (Assam), *P. citrifolium* var. *panamense* (Panama), *P. Clarkei* (India), *P. confusum* var. *latilimbium* (Brasil), *P. cornilimbium* (Sikkim), *P. corylistachyon* var. *Forbesii* (New

Guinea), *P. corylistachyon* var. *puberifolium* (New Guinea), *P. crassistipes* (Assam), *P. cuculebratum* (Panama), *P. curtistipes* (Sikkim), *P. dekkoonum* (Assam), *P. dilatatum* var. *leptocladum* (Costa Rica), *P. dilatatum* var. *pseudodilatatum* (Costa Rica), *P. divaricatarum* (Luzon), *P. el-muletonum*, *P. Falconeri* (India), *P. filipedunculum* (Sikkim), *P. fulvirameum* (Malacca), *P. Gallatayi* (Khasia), *P. Gamblei* (Sikkim), *P. Gammiei* (Assam), *P. Gaudichaudianum* var. *argentinum* (Tucuman), *P. Gibsoni* (India), *P. glabramentum* (Assam), *P. glabrirhache* (India), *P. grandipedunculum* (Khasia), *P. graveolens* (New Guinea), *P. hispidonervum* (Brasil), *P. hispidirameum* (Borneo), *P. Humbloti* (Madagascar), *P. isopleurum* (Sikkim), *P. japponum* (India), *P. Jenkinsii* (Assam), *P. Kurzii* (Pegu), *P. latispicum* (China), *P. laxivenum* (Sikkim), *P. Listeri* (India), *P. magnipedunculum* (Hort. Bogor. India), *P. Mannii* (Khasia), *P. muneyporensis* (Muneypore), *P. mungpoanum* (India), *P. nigrum* var. *subpenninerve* (Perak), *P. obtusistigmum* (Nilgherries), *P. obumbratum* var. *parvifolium* (Paraguay), *P. Oldhamii* (India), *P. ootacamundense* (Ind. or.), *P. opacilimbum* (India), *P. ovatisistigmum* (Sikkim), *P. ovatoacuminatum* (Sikkim), *P. ovato-stemon* (India), *P. pachystachyon* var. *irazuianum* (Costa Rica), *P. parvilimbum* (Khasia), *P. perpilosum* (Borneo), *P. polytrichum* (Costa Rica), *P. porrectum* (Pegu), *P. pothoides* var. *macrophyllum* (New Guinea), *P. pseudopropinquum* (Panama), *P. puberulipes* (Ind. or.), *P. quintuplinervium* (New Guinea), *P. retinervulum* (Brasil), *P. retropilosum* (Brasil), *P. Richardianum* var. *glabrifolium* (Cuba, Jamaica), *P. Richardianum* var. *latilimbum* (Cuba), *P. rufescentibaccum* (Cochinchina), *P. rupigaudens* (Quelpart), *P. salinasanum* var. *verbenanum* (Costa Rica), *P. sangorianum* (Peru), *P. santa-martanum* (Santa Marta), *P. scabrilimbum* (Panama), *P. sikkimense* (Sikkim), *P. Sogerianum* (New Guinea), *P. sorsogonum* (Luzon), *P. subcanirameum* (New Guinea), *P. subrigidilimbum* (India), *P. Taqueti* (Corea), *P. tenuibracteum* (Sikkim), *P. tuberculatum* var. *minus*, *P. tuberculatum* var. *obtusifolium* (America centr.), *P. umbellatum* var. *geminatum* (Brasil), *P. umbellatum* var. *parvifolium* (Mauritius), *P. umbellatum* var. *tomentellum* (Costa Rica), *P. umbellatum* var. *vestitum* (Bolivia), *P. velutinibaccum* (Brazil), *Peperomia acrostigma*, *P. allagotacta* (Panama), *P. Bourneae* (Ind. or.), *P. calvifolia* (Costa Rica), *P. ciliolibractea* (Panama), *P. colossina* nom. nov. (*P. purpurea* Ridley), *P. copeyana* (Costa Rica), *P. cuneifolia* (Jamaica), *P. cylindriacca* (Panama), *P. dincorana* (Brasil), *P. Dusenii* (Madagascar), *P. elata* (Panama), *P. Elberti* nom. nov. (= *P. tenuipeduncula*), *P. fatoana* (Panama), *P. gatunensis* (Panama), *P. glabriramea* (Costa Rica), *P. Griggsii* (Guatemala), *P. gymnophylla* (Guatemala), *P. hiloana* (Ins. Sandwich), *P. hygrophiloides* (Panama), *P. Krzii* (India), *P. lancilimba* (Costa Rica), *P. longibacca* (Ecuador), *P. macrocarpa* (Costa Rica), *P. mameiana* (Panama), *P. maniensis* (Hawaii), *P. muscisedens* (Costa Rica), *P. nicoyana* (Costa Rica), *P. oblongibacca* (Panama), *P. oblongifolia* (Costa Rica), *P. obscurifolia* (Panama), *P. ouabianae* (*P. silvestris* C.DC. in Berlin Notizbl.), *P. panaiana* (Panai), *P. panamensis* (Panama), *P. pascuicola* (Panama), *P. Petriei* (New Zealand), *P. pililimba* (Guatemala), *P. platyphylla* (Costa Rica), *P. puberulirhachis* (Mexico), *P. punctata* (Costa Rica), *P. Ramosii* (Luzon), *P. Ridleyi* nom. nov. (*P. obliqua* Ridl. non Ruiz & Pav.), *P. Ruiziana* (*P. acuminata* Ruiz & Pav.), *P. saldassiana* (Brazil), *P. salmensis* (Hawaii), *P. sanramonensis* (Costa Rica), *P. sansalvadorana* (San Salvador), *P. Schiedei* (Mexico), *P. sessilifolioides* (Costa Rica), *P. sirupayana* (Bolivia), *P. stenocaulis* (Ecuador), *P. substriata* (Costa Rica), *P. Teiysmanni* (Amboina), *P. urocarpoides* (Panama), *P. Vano-verberghii* (Luzon), and *P. Wercklei* (Costa Rica).—A. S. Hitchcock.

4368. FASSETT, NORMAN C. A key to the northeastern American species of *Bidens*. Rhodora 27: 184-185. 1925.—The paper consists of a key to the 19 species of *Bidens* (including 1 hybrid) recognized by the author in the region between Maryland and the Gulf of St. Lawrence.—S. F. Blake.

4369. HASSLER, E. *Rivisio Specierum Austro-Americanarum Generis Phaseoli L.* [Revision of the South American species of the genus *Phaseolus* L.] Candollea 1: 417-472. 1923.—The introduction includes a table showing the distribution of the species in South and Central America. There is a key to the sections and to the species. The new species are: *Phaseolus chacoensis* (Gran Chaco, Fiebrig 1220), *P. brachycalix* (Paraguay, Fiebrig 4168). There are many new varieties.—A. S. Hitchcock.

4370. HITCHCOCK, A. S. The North American species of *Stipa*. Contrib. U. S. Nation.

Herb. 24: 215-262. Pl. 50-52. 1925.—This revision recognizes 40 species of *Stipa* in North America, which are keyed and fully described. The plates illustrate the fruits of each species. The paper closes with lists of unidentified and of excluded species. The following names are new: *Stipa coronata Parishii* (Vasey), *S. spartea curtiseta*, *S. saxicola*, *S. liantha*, *S. constricta*, *S. angustifolia*, *S. mexicana*, and *S. columbiana Nelsoni* (Scribn.).—S. F. Blake.

4371. HITCHCOCK, A. S. Synopsis of the South American species of *Stipa*. Contrib. U. S. Nation. Herb. 24: 263-289. 1925.—Eighty-nine species, 19 of which are new, are listed in this synopsis. The introduction, mentioning the principal sources of material for study, is followed by a key to the species. The species are enumerated with synonymy and lists of specimens examined, but without descriptions except in the case of the new forms. These are: *Stipa Milleana*, *S. Dusenii*, *S. capillisetata*, *S. nardoides* (Phil.) Hackel, *S. rosea*, *S. argentea*, *S. lenta*, *S. Karsteni*, *S. brachyphylla*, *S. papillosa* (Hack.), *S. Gilliesii*, *S. dasycarpa*, *S. violacea*, *S. curviseta*, *S. breviculmis*, *S. obtusa* (Nees & Mey.), *S. rigidiseta* (Pilger), *S. peruviana*, *S. hirtifolia*, *S. paniculata*, *S. Holwayi*, *S. disticha*, and *S. Pittieri*.—S. F. Blake.

4372. HONDA, M. Revisio Graminum Japoniae III. [Revision of the Japanese Gramineae III.] Bot. Mag. Tôkiô 37: 113-124. 1923.—This is the 3rd installment of the writer's critical study of the Japanese grasses. Nine species are treated, of which these 3 species, *Miscanthus flavidus*, *M. Matsudae*, and *Eriochloa Hackelii* are described as new. *Echinochloa crusgalli* (L.) Beauv. (*Panicum crusgalli* L.) is divided into 3 subspecies and 6 varieties, as follows: *Echinochloa crusgalli* (L.) Beauv. subsp. *genuina* (Hackel) vars. *typica*, *echinata* (Trin.); subsp. *submutica* (Meyer) vars. *typica*, *hispidula* (Retzius); subsp. *colona* (L.) vars. *typica*, and *edulis* (Hitchc.).—T. Fukushima.

4373. HONDA, MASAJI. Revisio Graminum Japoniae V. [Revision of Japanese grasses V.] Bot. Mag. Tôkyô 38: 119-129. 1924.—Adopting the generic name *Syntherisma* in place of *Digitaria* the author reports the following species of *Syntherisma* in Japan: *Syntherisma sanguinalis* (L.) Dulac, and its vars. *ciliaris* (Retzius), *multinervis*, and *evalvula*; *S. formosana* (Rendle) and var. *hirsuta*; *S. platycarpa* (Trinius); *S. barbata* (Willd.) Nash; *S. longiflora* (Retzius) Skeels; *S. Ischaemum* (Schreber) Nash, and var. *lasiophylla*; *S. filiformis* (L.) Nash; *S. Henryi* (Rendle); *S. sericea*; and *S. Hayatae* with its var. *magna*. In this paper, moreover, *Ichnanthus axillaris* (Nees) Hitchcock & Chase has been reported as new to the Japanese flora, and the scientific name *Coridochloa semi-alata* Nees (vars. *typica* and *ambigua*) has been adopted, being thought better than *Panicum semi-alatum* R. Brown or *Axonopus semi-alatus* J. D. Hooker.—Author (Courtesy Japanese Jour. Bot.).

4374. HONDA, MASAJI. Revisio Graminum Japoniae VI. [Revision of Japanese grasses VI.] Bot. Mag. Tôkyô 38: 189-201. 1924.—This article contains 2 genera, *Oplismenus* and *Chaetochloa* (*Setaria* of many authors), which are divided as follows: *Oplismenus japonicus* (*Panicum japonicum* Steudel), *O. imbecillis* Roem. & Schultes and its var. *morrisonensis*, *O. Burmanni* Beauvois and its var. *intermedius*; *Chaetochloa chondrachne* (*Panicum chondrachne* Steudel), *C. rariflora* (Mikan) Hitchcock & Chase, *C. lutescens* (Weigel) Stuntz var. *genuina* and var. *longispica*, *C. viridis* (L.) Scribner, and vars. *genuina*, *purpurascens* (HBK.) and *pachystachys* (Franchet & Savatier) with subvars. *typica*, *lanceolata* (Hackel) and *linearia*; *C. gigantea* (Franchet & Savatier) vars. *genuina*, *pilosa*, *furcata*, *C. italica* (L.) Scribner, and its var. *germanica* (Miller) Scribner.—Author (Courtesy Japanese Jour. Bot.).

4375. JOHNSTON, IVAN MURRAY. Studies in the Boraginaceae IV. The North American species of *Cryptantha*. Contrib. Gray Herb. N. S. 74: 2-114. 1925.—The author gives a brief account of the taxonomic history of the plants now included in *Cryptantha*. In the present paper *Cryptantha* is taken as including *Krynitzkia*, *Piptocalyx*, *Eremocarya* and *Johnstonella*. All the North American species are annual herbs. The several basal pairs of leaves are opposite with short sheathing connate bases; yet this genus has been repeatedly described as having consistently alternate leaves. In most of the species the calyx is deciduous, although some of the species have persistent or subpersistent calyces. One has a circumscissile calyx. The nutlets are extremely varied in form and surface and serve very largely for the delimitation of species. Homomorphous and heteromorphous nutlets are known within the genus. *Cryptantha* is believed to have been evolved from the genus *Oreocarya* and this in turn from the *Lithospermeae* through some forms similar to the North American species

of *Antiphytum*. Other phylogenetic conclusions, discussed in detail, relate chiefly to the larger generic and tribal lines of evolution rather than to interspecific relationship. Fifty-seven species are recognized as occurring in North America. About as many more are known to occur in Chile, Argentina and Peru. In North America most of the species occur in California, 45 being known from that state alone. One species ranges northward to southern Alaska and another occurs as far south as southern Mexico. The systematic account of the genus includes a complete synonymy for the genus and its species with references to the important literature. Each species is described in detail and for each is given a complete citation of specimens. A dichotomous key is provided for the purpose of distinguishing the species. The following new species and varieties are characterized and new combinations are made: *Cryptantha micrantha* (Torr.) Johnston var. *genuina*, *C. Grayi* (Vasey & Rose) Macbr. var. *genuina*, *C. circumscissa* (H. & A.) Johnston var. *genuina*, *C. circumscissa* var. *hispida* (*Greeneocharis circumscissa* var. *hispida* Macbr.), *C. maritima* Greene var. *genuina*, *C. maritima* Greene var. *cedrosensis* (*Krynitzkia cedrosensis* Greene), *C. pterocarya* (Torr.) Greene var. *genuina*, *C. decipiens* (Jones) Heller var. *genuina*, *C. decipiens* (Jones) Heller var. *corollata*, *C. nevadensis* Nels. & Kenn. var. *genuina*, *C. nevadensis* Nels. & Kenn. var. *rigida*, *C. muricata* (H. & A.) Nels. & Macbr. var. *genuina*, *C. muricata* (H. & A.) Nels. & Macbr. var. *denticulata* (*Krynitzkia denticulata* Greene), *C. mariposae*, *C. Traskae*, *C. Torreyana* (Gray) Greene var. *genuina*, *C. Torreyana* (Gray) Greene var. *calistogae*, *C. Torreyana* (Gray) Greene var. *pumila* (*C. pumila* Heller), *C. Clevelandi* Greene var. *genuina*, and *C. Clevelandi* Greene var. *florosa*. The paper is concluded with an index to the numbered exsiccatae cited in the monograph.—*E. B. Payson*.

4376. JOHNSTON, IVAN M. *Studies in the Boraginaceae*.—V. Contrib. Gray Herb. 75: 40–49. 1925.—1. Concerning the range and identity of certain American species. Critical notes are given concerning species of *Lithospermum*, *Lasiarrhenum*, *Antiphytum*, *Eritrichium*, *Myosotis*, *Lappula*, *Pectocarya*, and *Coldenia*. *Lithospermum cinerascens* (*Macromeria cinerascens* A. DC.) is a new combination published.—2. New or otherwise interesting Asiatic borages. *Lasiocaryum* n. gen. is proposed to supersede the preoccupied *Oreogenia* Johnston. The following new combinations are made and new species published: *Lasiocaryum Munroi* (*Eritrichium Munroi* Clarke), *L. trichocarpum* (*Microcaryum trichocarpum* Hand.-Maz.), *Trigonotis contortipes*, *T. Rockii*, *T. vestita* (*T. peduncularis* var. *vestita* Hemsl.), *T. tibetica* (*Eritrichium tibeticum* Clarke), *T. tibetica* var. *minor* (*E. tibeticum* var. *minor* Clarke), and *Microula hirsuta*.—*E. B. Payson*.

4377. LAM, H. J. Notiz ueber *Vitex*. [Note on *Vitex*.] Bull. Jard. Bot. Buitenzorg III. 5: 175–178. 1922.—Additions and corrections are made to the author's Revision of *Vitex* (Ibid. III. 3: 47–64) including the description of a new species, *Vitex Sebesiae*.—*Alfred Rehder*.

4378. MUNZ, P. A., AND I. M. JOHNSTON. *The Oenotheras of northwestern South America*. Contrib. Gray Herb. 75: 15–23. 1925.—The present paper is concerned with the *Oenotheras* of Bolivia, Peru, Ecuador, Colombia and Venezuela. A key is given to the 12 species recognized, although no pretense is made to finality in the present treatment. Specimens are cited for the recognized species. The following new species, varieties, names and combinations are included: *O. multicaulis* R. & P. var. *tarquensis* (*O. tarquensis* HBK.), *O. Feathers-tonei*, *O. laciniata* Hill. var. *limensis*, *O. arequipensis*, and *O. fusiformis*.—*E. B. Payson*.

4379. PILGER, R. Beiträge zur Kenntnis der Gattung *Plantago*. VI. *Plantago gentianoides* Sibth. et Sm. [Contributions to the genus *Plantago*. VI. *P. gentianoides* Sibth. & Sm.] Repert. Spec. Nov. Regni Veg. 21: 97–102. 1925. (Repert. Eur. et Med. 1: 673–678. 1925.)—The following new varieties and forms are given, with Pilger as authority: *Plantago gentianoides* Sibth. & Smith var. *eugentianoides* (*P. gentianoides* Sibth. & Sm. sens. str.), f. *orbetica* (*P. media* L. *orbetica* Griseb.), subf. *minor*, from Rilo in Bulgaria; var. *alpina* (*P. Griffithii* Decne. var. *β. alpina* Bornm.), f. *nivalis* (*P. Griffithii* Decne. var. *nivalis* Bornm.); var. *tenuispicata*, from Persia; var. *angusta*, from southern Persia; var. *Griffithii* (*P. Griffithii* Decne.); and var. *tatarica* (*P. tatarica* Decne.).—*John E. Dinsmore*.

4380. SAINT-YVES, ALFR. *Les Festuca* (Subg. *Eu-Festuca*) de l'Afrique du Nord et des Iles Atlantiques. [Festuca, subg. *Eufestuca*, of North Africa and the Atlantic Islands.] *Candollea* 1: 1–63. Fig. 1–25. 1922.—In part 1 are considered the species of North Africa,

including the sections *Ovinæ*, *Borinæ*, *Subbulbosæ*, *Variae*, *Scariosæ*, and *Montanæ*, the arrangement and nomenclature being as in Hackel's *Monographia Festucarum Europæarum*. There are descriptions, keys, synonymy, and distribution. Special attention is given to the anatomy and there are many figures of cross sections of leaves. *Festuca Mairei*, from Morocco, is described as new. There are also several changes in the ranks of divisions below the species and descriptions of new subdivisions. The 2nd part is devoted to the species found in the Azores, Canaries, and Madeira.—A. S. Hitchcock.

4381. SLOOTEN, D. F. VAN. The Flacourtiaceæ of the Dutch East Indies. Bull. Jard. Bot. Buitenzorg III. 7: 291-421. Fig. 1-15. 1925.—A revision is made of the Flacourtiaceæ of the Dutch East Indies with a key to the genera, keys to species, and with full citation of literature, enumeration of the specimens examined, and critical remarks; only the new species and those proposed by the author in 1919 in his dissertation on the Combretaceæ and Flacourtiaceæ are described. The following genera, species and names are new: *Eleutherandra* with *E. pes-cervi*, *Hemiscolopia* with *H. trimera* (Boerl.), *Mesaulosperma* with *M. Stapfii* (Kds.), *Taraktogenos gracilis*, *Hydnocarpus setumpul*, *Ryparosa multinervosa*, *R. micromera*, *Homalium fallax*, *H. crassipes*, *Flacourtia rindjanica*, *Xylosma Pullei*, *X. sumatrana*, *Osmelia grandistipulata*, *Casearia gigantifolia*, and *C. halmaherensis*.—Alfred Rehder.

4382. STANFORD, E. E. The amphibious group of *Polygonum*, subgenus *Persicaria*. I. Adaptation in *Polygonum amphibium*. *Rhodora* 27: 109-112. 1925.—A summary is given of European experiments and observations on *Polygonum amphibium* under different ecological conditions. Three principal forms are recognized: var. *natans*, var. *terrestre*, and var. *maritimum*.—S. F. Blake.

4383. STANFORD, E. E. The amphibious group of *Polygonum*, subgenus *Persicaria*. II. The American amphibious *Persicarias*. *Rhodora* 27: 125-130, 146-152, 156-166. 1925.—The taxonomic history of the American species of the *Polygonum amphibium* group is given in much detail. Greene's view that the species are very numerous is considered untenable, the characters used by him in the separation of species being chiefly ecological. The 3 species recognized, each with several formæ or varieties, are keyed and described. *Polygonum amphibium* L. is European, and known in North America only as an introduction in Nova Scotia. The native American species are *P. natans* A. Eaton (*P. amphibium* of American authors) and *P. coccineum* Muhl. (*P. enersum* and *P. Muhlenbergii* of authors). New names are: *P. amphibium* L. f. *natans* (Moench), *P. natans* A. Eaton f. *genuinum*, f. *Hartwrightii* (Gray), var. *insigne* (Greene), *P. coccineum* Muhl. f. *terrestre* (Willd.), f. *natans* (Wiegand), var. *rigidulum* (Sheldon), var. *pratincola* (Greene).—S. F. Blake.

4384. STANFORD, E. E. *Polygonum pennsylvanicum* and related species. *Rhodora* 27: 173-184. 1925.—The history of *Polygonum pennsylvanicum* L. and related species is traced. *P. bicorné* Raf. is considered an unidentifiable species. Five species, with several varieties, are keyed and described, the new names being the following: *P. pennsylvanicum* L. var. *laevigatum* Fern. f. *pallescent*, *P. pennsylvanicum* L. var. *durum*, *P. segetum* HBK. var. *verrucosum*, *P. longistylum* Small var. *omissum* (Greene), *P. mississippiense*, *P. mississippiense* var. *interius*. Pronounced heterostyly, with segregation of the different types of flowers on different plants, occurs in *P. longistylum* and *P. mississippiense*, while *P. pennsylvanicum*, *P. segetum*, and *P. mexicanum* show some approach to the same condition.—S. F. Blake.

4385. TANAKA, TŌZABURŌ. Principal species of citrus fruits of the world. (Japanese.) Bul. Sci. Fakult. Terkult. Kjusu Imp. Univ. 1: 20-31. 1924.—Twelve species of *Citrus* described by Swingle in 1922 are redescribed here, as the result of a field survey conducted in the Orient and in Europe, as well as from a study in the important herbariums of both the East and the West. A few revisions of names are proposed. To this list, 5 hitherto imperfectly known species are added, among which 1 is new. The greatest ambiguity and weakness in the taxonomy of the genus are here attributed to the lack of thoroughness in the type conception, allowing too liberal presumption for the origin of type and for the analysis of the distinguishing characters to which the feasibility of species segregation is solely dependent. It is strongly suggested that every type, whether occurring wild or cultivated, should be critically observed in the actual state without regard to its origin by seed or grafting. Characters which are unique and specific are the only accessible basis of species

determination, and from this point of view, segregation of types of the so-called "nobilis group" are proposed, as evidenced by the case of *C. nobilis*, *C. deliciosa*, and *C. unshiu*. Equal treatment of garden and wild species is therefore highly recommended under such circumstances. It is also proposed that the garden species thus brought to the rank of wild species should be named without authority, substituting the term "Hortulanorum" in its stead, as in the name *C. unshiu* Hort. It is, however, not recommended to name any definite or presumable hybrid occurring cultivated in the gardens. The proposed scheme of classification of the known species of *Citrus* is shown as follows: *Citrus medica* Linn. (citron), *C. Limon* Burm. (European lemon), *C. aurantifolia* Swingle (lime), *C. maxima* (Burm.) Merrill (pummelo), *C. Aurantium* Linn. (sour orange), *C. sinensis* Osbeck. (sweet orange), *C. nobilis* Lour. (king orange; Kunembo), *C. deliciosa* Ten. (Mediterranean mandarin), *C. unshiu* Hort. (satsuma orange; Unshû mikan), *C. mitis* Blanco (Calamondin; Tôkinkan), *C. ichangensis* Swingle (Ichang lemon), *C. bergamia* Risso & Poiteau (Bergamot orange), *C. histrix* DC. (swangi orange n. name), *C. macroptera* Mont. (Cabuyao orange n. name), *C. limonia* Osbeck (Canton lemon n. name; Ningmung; Otaheite orange; Hiram lemon), *C. limetta* Risso (Lumia), *C. junos* (Sieb.) Tanaka (Yuzu; Kansu orange), *C. tachibana* (Makino) Tanaka n. sp. (Tachibana). Additions to the list are promised as a result of the study now in progress.—Author (Courtesy Japanese Jour. Bot.).

4386. WIDDER, F. J. Übersicht über die bisher in Europa beobachteten *Xanthium*-Arten und Bastarde. [The species and hybrids of *Xanthium* hitherto observed in Europe.] Repert. Spec. Nov. Regni Veg. 21: 273-305. 1925. (Repert. Eur. et Med. 1: 689-721. 1925.)—This is an exhaustive paper, supplementary to the author's monograph which was published in the Repert. Spec. Nov. Regni Veg. 20: 1923. The following are apparently described for the first time: *Xanthium saccharatum* Wallroth subsp. *eusaccharatum* from N. America and Italy; subsp. *commune* (X. *commune* Britton); subsp. *aciculare* from N. America, the Balkans, etc.; *X. Cavanillesii* × *orientale* = × *X. Wallrothii* from France; *X. italicum* × *orientale* = × *X. catalanicum* Sennen & Pau.—John E. Dinsmore.

4387. WIEGAND, K. M. *Oxalis corniculata* and its relatives in North America. *Rhodora* 27: 113-124, 133-139. 1925.—The history of the group is sketched, and the diagnostic value of the pubescence of the filaments in the discrimination of the species discussed. The 10 species recognized, with their numerous varieties and forms, are keyed and described, with their synonymy and the citation of specimens examined. New names are *Oxalis californica* (Abrams) Knuth var. *subglabra*, *O. Wrightii* Gray var. *subpilosa*, var. *pilosa* (Nutt.), *O. corniculata* L. var. *viscidula*, var. *Langloisii* (Small), *O. stricta* L. var. *piletocarpa*, *O. florida* Salisb. var. *strigosifolia*, *O. europaea* Jord. f. *pilosella*, f. *cymosa* (Small), f. *villicaulis*, var. *Bushii* (Small), f. *subglabrata*, f. *vestita*, *O. recurva* Ell. var. *texana* (Small), var. *macrantha* (Trel.), f. *sericea*, and var. *floridana*.—S. F. Blake.

4388. YUNCKER, TRUMAN G. The Convolvulaceae of Indiana. Proc. Indiana Acad. Sci. 38: 273-280. Fig. 1-27. 1923.—A diagnostic key to 3 of the 4 genera of this family is given. Eleven species are recognized, 1 in the genus *Quamoclit*, 4 in the genus *Ipomoea*, and 6 in the genus *Convolvulus*. Leaves and their variations in the species are illustrated.—Edwin J. Kohl.

FLORISTICS AND PLANT DISTRIBUTION

4389. ANONYMOUS. Census of Victorian plants. Supplement No. 3. Victorian Nat. 42: 130-132. 1925.—This note consists of additions, alterations and corrections to lists already published.—Wm. Randolph Taylor.

4390. ALM, C. G., OCH TH. C. E. FRIES. Floristiska anteckningar från Karesuando och Enontekis socknar. [Floristic notes from Karesuando and Enontekis (parishes in Swedish Lapland).] Svensk Bot. Tidskr. 19: 250-262. 1925.—A list of plant localities is given. *Salix depressa* var. *cinerascens*, *Erigeron unalaschkensis*, *Draba alpina* and *Carex pedata* are noted as especially remarkable. *Arenaria norvegica* is reported as new for Finnish Enontekis.—O. Heilborn.

4391. BLAKE, S. F. Records of *Bidens frondosa* var. *anomala* Porter. *Rhodora* 27: 34-35. 1925.—This variety is recorded from Massachusetts and the vicinity of Washington,

D. C. The record of *Bidens bidentoides* from the District of Columbia in the "Flora of the District of Columbia and Vicinity" is shown to be based on specimens of *B. connata* var. *anomala* Farwell.—S. F. Blake.

4392. DEAM, CHAS. C. Plants new to Indiana, XI. Proc. Indiana Acad. Sci. 38: 263-264. 1923.—The following plants are enumerated: *Iosetes Engelmanni* A. Br., *Eragrostis hirsuta* (Michx.) Nees., *Melica nitens* Nuttall, *Cyperus pseudovegetus* Steud., *Juncus dichotomus* Ell., *Carex annectans* Bicknell, *Crotalaria sagittalis* L., *Ludwigia glandulosa* Walt., *Chaerophyllum procumbens* var. *Shortii* T & G., *Lappula Redowskii* var. *occidentalis* (Wats.) Rydb., *Mentha Cardiaca* Gerarde., *Plantago Purshii* R. & S., *Houstonia angustifolia* Michx., and *Sonchus uliginosus* Bieb.—Edwin J. Kohl.

4393. EATON, MARY E. Pages from the floral life of America. Nation. Geog. Mag. 48: 44-75. 55 illus. (col.). 1925.—Reproductions are given from paintings of 55 different flowers of 49 different families making "a representative cross section of the floral life of America." They are accompanied by popular descriptions.—W. M. Atwood.

4394. FLINTOFF, R. J. *Inula Helenium* Linn. in North-east Yorkshire. Naturalist 1925: 347. 1925.—The plant has persisted in this station for 89 years.—W. H. Burrell.

4395. FLINTOFF, R. J. *Lactuca alpina* Benth. in North-east Yorkshire. Naturalist 1925: 315. 1925.—This plant has been found thriving under truly wild conditions.—W. H. Burrell.

4396. GADECEAU, E. L'aire du *Quercus Toza* au nord de la Loire. [The area of *Quercus Toza* north of the Loire.] Bull. Soc. Sci. Nat. Ouest France Ser. IV, 3: 11-12. 1923.—The author cites the localities north of the Loire, which are occupied by *Quercus Toza*. His researches confirm those of the Abbe Hy, thereupon establishing the northern limits of the oak which extend little beyond those of the cultivation of the vineyard.—A. de Puymaly (translated).

4397. GROFF, G. W., EDWARD DING, AND ELIZABETH GROFF. An enumeration of the McClure collection of Hainan plants. Lingnaam Agric. Rev. 1st: 27-86; 2nd: 9-41; 3rd: 115-139; 3rd: 18-34. 1922-1925.—In this list the names are arranged in the Engler and Prantl order. Full field data, including Chinese names, are given.—Albert N. Steward.

4398. HEIMLICH, LOUIS F. Plants of White County [Indiana].—V. Proc. Indiana Acad. Sci. 38: 281-289. Fig. 1-4. 1923.—A long list of plants and the families to which they belong are given.—Edwin J. Kohl.

4399. HENRARD, J. T. Plants, collected during the year 1922 by Mr. and Mrs. Visser-Hooft during their Kara-Korum-expedition. Mededeel. Rijks Herb. 52: 1-9. 1925.—In this collection 22 families are represented by fully annotated specimens found in western Himalaya, Tibet, Sikkim Himalaya, Nubra Valley near Takse, Gongmoolong Valley, and Lashi Valley and glacier.—M. F. L. Fitzpatrick.

4400. ISING, E. H. A rare South Australian plant. South Australian Nat. 6: 69. 1 pl. 1925.—Notes are given on *Uldinia mercurialis* J. M. Black.—Wm. Randolph Taylor.

4401. ISING, E. H. Botanical notes. South Australian Nat. 6: 31-32. 1925.—The variation in floral parts and the distribution of *Loranthus pendulus* Sieb. and *L. Preissii* Miq. are discussed.—Wm. Randolph Taylor.

4402. ISING, E. H. Botanical notes. South Australian Nat. 6: 45-51. 1925.—A list of many plants recorded with geographic data is given, including especially *Loranthus pendulus* Sieb., species of *Eucalyptus*, *Astroloma humifusum* (Car.) R. Br., and a separate list of introduced Compositae.—Wm. Randolph Taylor.

4403. JAAP, O. Ein weiterer Beitrag zur Gefäßpflanzen-Flora der nördlichen Prignitz. [A further contribution to the flora of woody plants of northern Prignitz.] Verhand. Bot. Vereins Brandenburg 65: 5-20. 1923.—This is a posthumous publication listing the woody plants found in the northern Prignitz district not included in the list of plants from this region published by the same author about 25 years ago.—H. L. Blomquist.

4404. LILLO, MIGUEL. Segunda contribucion al conocimiento de los arboles de la Argentina. Notas sobre el herbario Venturi. [Second contribution on the trees of Argentina. Notes on the Venturi herbarium.] 55 p. (Univ. Nacional Tucumán) "Coni": Buenos Aires, 1924.—This paper consists of notes on the dendrology and taxonomy of about 100 Argentine trees. Concerning many of them there had been discrepancies in the works of Lillo

and Spegazzini, owing to the lack of complete specimens in the collection upon which those works were based.—*W. N. Sparhawk.*

4405. LOTHOUSE, T. ASHTON. Tees-side plants. *Naturalist* 1925: 315. 1925.—The author adds *Erythra pulchella* and *Juncus Gerardi* to the North Riding flora.—*W. H. Burrell.*

4406. NILSSON, GUNNAR. Bidrag till Västergötlands kärlväxtflora. [Contributions to the flora of Västergötland (province in Sweden).] *Svensk Bot. Tidskr.* 19: 236-249. 1925.—A list of plant localities is given. *Salix phylicifolia* L. is specially reported from the most southern locality hitherto observed in Sweden. Its occurrence there is regarded as a result of recent migration, not as a glacial relic.—*O. Heilborn.*

4407. PALMER, ERNEST J. Is *Quercus arkansana* a hybrid? *Jour. Arnold Arboretum* 6: 195-200. 1925.—The author comes to the conclusion that *Quercus arkansana* Sargent, considered by some botanists a hybrid between *Q. marilandica* Muench. and *Q. nigra* L., is not a hybrid, but a species formerly more widely distributed but now restricted to comparatively few widely scattered localities.—*Alfred Rehder.*

4408. PEARSALL, W. H., AND F. A. MASON. Middleton-in-Teesdale and its natural history. *Naturalist*. 1925: 214-218, 249-252. 1925.—A report of Y. N. U. field meeting has ecological notes, plant records, and an extensive list of lichens.—*W. H. Burrell.*

4409. PESCOTT, E. E. Two autumn Greenhood orchids. *Victorian Nat.* 42: 65-66. *Pl.* 2. 1925.—*Pterostylis truncata* Fitz. and *P. reflexa* R. Br. with their habitats are described and illustrated.—*Wm. Randalph Taylor.*

4410. PESCOTT, E. E., AND C. FRENCH, JR. Thirty years' orchid collecting. *Victoria Nat.* 41: 221-229. *Pl.* 7-8. 1925.—A general account of orchid rarities which the author discovered, including especially *Pterostylis grandiflora* R. Br., *P. decurva* Rogers, *Acianthus caudatus* R. Br., *Prasophyllum Brainei* Rogers and *P. odoratum album* Rogers which are figured. A list of 95 species with localities is given.—*Wm. Randalph Taylor.*

4411. RECORD, SAMUEL J. Distribution of the species of *Swietenia*. *Tropical Woods* 1: 2-4. 1925.—This consists of notes on the distribution of the 5 species of true mahogany. Logs recently obtained from the Amazon region of Peru have been identified as *Swietenia* sp.—*W. N. Sparhawk.*

4412. RECORD, SAMUEL J. Preliminary check list of British Honduras woods. *Tropical Woods* 1: 14-16. 1925.—This list of botanical and vernacular names is based on several collections of wood samples and botanical specimens.—*W. N. Sparhawk.*

4413. ROBINSON, J. FRASER. *Hippocrepis comosa* L., an East Riding plant. *Naturalist* 1925: 213. 1925.—A first record is given, in plenty, on a portion of the wold probably never under plough.—*W. H. Burrell.*

4414. SCHWEINFURTH, CHARLES. *Cypripedium reginae* in New Hampshire. *Rhodora* 27: 107-109. 1925.—A record is made of *Cypripedium reginae* Walt., rare in New Hampshire, from Campton, Grafton County.—*S. F. Blake.*

4415. SNOWDON, F. *Centaurium capitatum* in North-east Yorkshire. *Naturalist* 1925: 346. 1925.—A new county record is made for this plant.—*W. H. Burrell.*

4416. [VLESIDOS, THRAS. S.] Βλησιδος, Θρασ. Σ. Συστηματική ασική Βοτανική. [Systematic forest botany.] vii + 248 p. 100 fig. Τυπογράφειος Παρασκευά Λεώνη: Ἀθήναι, 1924.—This work deals chiefly with the trees and larger shrubs of Greece.—*W. N. Sparhawk.*

4417. WHITE, C. T. The Eucalypts or gum trees of the Brisbane district IV. *Queensland Nat.* 5: 43-45. 2 pl. 1925.—The botanical characters and timber of *Eucalyptus tereticornis* Sm. and *E. propinqua* D. & M. are described, their distribution outlined, and the basal portion of their stems illustrated by photographs.—*W. D. Francis.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

SAM F. TRELEASE, *Editor*

4418. ANONYMOUS. British scientific and technical books. [Rev. of: BRITISH SCIENCE GUILD. A catalogue of British scientific and technical books: covering every branch of science and technology, carefully classified and indexed. *New ed.* xxii + 489 pp. A. and F. Denny: London, 1925.] *Nature* 116: 386. 1925.

4419. ANONYMOUS. **Famine prevention program.** Univ. of Nanking, Coll. Agric. and For. Ser. 1^o: 1-16. 4 pl. 1924.—A presentation is made of the program of the above-named institution for famine prevention through the aid of funds appropriated by the American Committee for China Famine Fund. This plan is given under the headings of instruction, research and extension in forestry, agricultural extension, farm crop improvement, economic and farm management studies, coöperative extension, plant and animal disease control, rural engineering, agricultural education, research library, and scholarships for agriculture and forestry students.—*Albert N. Steward.*

4420. ANONYMOUS. **Paper from rubber latex.** Brooklyn Bot. Gard. Rec. 14: 125-126. 1925.

4421. AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. **Summarized proceedings of the American Association for the Advancement of Science for the period from June, 1921, to June, 1925.** 979 p. Amer. Assoc. Adv. Sci.: Washington, D. C., 1925.—This volume reports the 74th to the 79th meetings, inclusive, and includes an annotated list of organizations officially associated with the Association and a directory of fellows and other members for the period from June, 1921, to June, 1925.—*Frederick V. Rand.*

4422. BARNARD, J. E. **A comparison ultra-microscope.** Jour. Roy. Microsc. Soc. London 1925: 133-140. 8 fig. 1925.

4423. BELLING, JOHN. **On the advancement of science by published papers.** Nature 116: 539. 1925.—This is a set of 9 rules concerning what should and should not be included in scientific papers.—*O. A. Stevens.*

4424. CARNE, W. M., AND T. STEELE. **The plants of the Bible.** Australian Nat. 5: 229-234. 1925.—Carne disagrees with the interpretations in certain instances in Steele's article in the Australian Nat. 5: 135. 1924.—Steele replies.—*T. C. Frye.*

4425. CLAY, REGINALD S. **The development of the Culpeper microscope.** Jour. Roy. Microsc. Soc. London 1925: 167-173. 6 fig. 1925.

4426. DA FANO, C. **Golgi-Cox preparations mounted permanently in series.** Jour. Roy. Microsc. Soc. London 1925: 163-166. 1925.

4427. DA FANO, C. **On the mounting in series of specimens stained by the Weigert-Pal method.** Jour. Roy. Microsc. Soc. London 1925: 159-162. 1925.

4428. MARKLE, M. S. **Notes on microtechnique. II.** Proc. Indiana Acad. Sci. 38: 323-324. 1922 [1923].—This is a record of some details that may prevent the making of satisfactory preparations by the paraffin and Venetian turpentine processes. A simplified hot plate is described. The use of a dilute solution of celloidin for holding in place spores, starch grains, and similar objects is suggested. Amitosis in the epidermis of tulip is recommended for class use.—*Edwin J. Kohl.*

4429. SARGENT, C. S. **The Arnold Arboretum Expedition to North Central Asia.** Jour. Arnold Arboretum 6: 213-216. 1925.—This is a note on an expedition that was made at the end of 1924 to northwestern China and northern Thibet under J. F. Rock for the purpose of collecting specimens and seed for the Arnold Arboretum.—*Alfred Rehder.*

4430. SHARP, L. W. **Program of the International Congress of Plant Sciences.** Science 62: 412-413. 1925.

4431. THOMSON, G. M. **Scientific research in New Zealand.** New Zealand Jour. Sci. and Tech. 8: 41-64. 1925.—The report includes statements of the principal botanical researches now being carried on, both private and institutional.—*H. H. Allan.*

